The Builder.

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Lunatic Asylums.

ABOUT this time last year, we collected from the Nineteenth Report of the Commissioners in Lunacy much information concerning the provision for the insane, and as to the asylums then left to be provided. The Twentieth Report has just now appeared; and as we continue to think that those who have to plan asylums should be acquainted with the matter contained in the several reports, we here supplement our former notice with particulars of the works of the last twelve months, and with such information respecting projected works, as seems calculated to interest professional readers. First, however, we may mention that the total number of lunatics in the County and Borough Asylums, Hospitals, Metropolitan and Provincial Licensed Houses; and Naval, Military, and State Criminal Asylums, of England and Wales, was on the 1st of January 30,869, as against the number 29,425 of the same date of last year. The number of patients deemed curable is 3,479; which is actually less than the number on the 1st of January, 1865, when there were 3,534 under that head, out of the 29,425. Thus the demand for asylums must be considered increased in an important degree.

To supply the want, we note only three actual additions, or in the shape of entire new buildings in fresh localities, that is to say the joint asylum for the counties of Carmarthen, Cardigan, and Pembroke; a second asylum for the county of Surrey, not opened at the date of the Report; and the asylum for the City of London. Moreover, it will be understood that the number 30,869 does not include the lunatics and idiots in workhouses. There were, of these, on the 1st of January, 1865, 9,756, as compared with the number 9,608 on the 1st of January, 1864. There are now 688 workhouses in England and Wales. Of them, 104 contain separate wards for the insane. The disclosures recently made as to the condition of the sick-poor in workhouses have, we fear, fallen far short of the facts as to the inmates of the lunatic class. The Commissioners acknowledge "the cordial assistance and co-operation of the Poor Law Board," but say that "as a rule the treatment of insane inmates" of workhouses "continues to be far from satisfactory." It is clear to us that these words are only too leniently uttered; and it is equally apparent that the force of the Commission, for inspection generally, should be increased. The workhouses containing the separate wards are visited at least once a year; but the inspection of the remaining 584 is spread over a larger space of time. The "dull and cheerless aspect of the wards," and "absence of all means for occupation, amusement, and out-door exercise," are still complained of by the Visiting Commissioners, as well as insufficient dietary, imperfect registration, and want of proper attendance.

At the Wigan workhouse, the Commissioners had to recommend the removal of iron bars from the windows, and also that a small walled airing-court, then covered with cinders, should be planted. The guardians decided that no changes were required; and Boards of Guardians generally are represented as objecting to adopt any suggestions for improvements, however obvious and necessary. At Narberth, the guardians deemed "that inmates requiring exercise and variety of scene should not be consigned to a workhouse." On the matter of diet, the medical officers of the Unions sometimes make things pleasant by reporting against any change,—the report at Wigan being that the increase proposed would be likely to produce "injurious rather than beneficial effects." With proper regulations, and provided no recent cases be received, the Commissioners are still of opinion that a larger proportion of imbeciles and old chronic cases could be retained in workhouses, so that the pressure for increased accommodation in county asylums might be reduced.

In a report, generally favourable, as to the Camberwell Union Workhouse, the cleansing and tinting in colours, of the wards, are mentioned with approval, as much conducing to cheerfulness; and similarly mentioned is a reduction of the number of beds, increasing the cubical space for each patient. Want of space in the airing-courts, however, is pointed out as a defect; and it is recommended that the corridor attached to each ward should be warmed in winter and otherwise made comfortable for exercise. In the course of the report on the new Manchester Workhouse, the remark is made that when it is found practicable to provide, by means of workshops, for employment of such of the men as can work at trades, and when a portion of the women can be put to washing and laundry work, there can be no doubt that the result will justify any outlay incurred. As to the Whitechapel Workhouse, the male-imbecile ward is strongly condemned in a report dated in July last: the day-room is spoken of as confined and cheerless, and the dormitory as overcrowded; and the only place for washing, in-doors, was a dark cellar in the basement, approached by a long flight of steps. The airing-court is described as bounded by lofty buildings on the two longer opposite sides, and as "cheerless in the extreme;" whilst, the report continues,—"The erection of a wing, five or six stories in height, which will constitute the male infirmary, has had the effect of still further intercepting light and air from this wretched court, to which the adjoining new dead-house and *post-mortem* room will be in most objectionable proximity;" and, in conclusion,—"No arrangement has been made for the out-door exercise of the male imbeciles, who never go beyond their yard." The report on the Bradford Union Workhouse speaks of a new infirmary in course of construction, as partly enclosing one of the yards, and likely to impede circulation of air. In the case of the Basford Workhouse, stone floors, unprovided with matting, are mentioned; and certain dormitories, having 270 to 330 cubic feet per patient, are pointed out as overcrowded. As to the Bristol Workhouse, it is said there is much that is not compatible with proper treatment and comfort of inmates of unsound mind. "Bare unplastered walls everywhere;" and "an almost entire absence of furniture" are noted. Easy seats for the epileptics, and some small matters of ornament are mentioned as "urgently required." The "large unsightly fireguards" are said to be "wholly unnecessary." The report adds,—"Still more objectionable are the iron guards or bars lately placed to all the dormitory-windows in both wards, and which appear to have been brought from St. Peter's Hospital, and put up here because of the recent escape of one of the inmates, since removed to the borough-asylum. No patients should be kept in a workhouse who require, in the opinion of its medical officer, or other authorities, such provision to be made for their safety; and not only the bars, but such of the present inmates as are supposed to need them, should, as soon as possible, be taken away." Re-arrangement of the dormitories, to admit, in every case, of at least 500 cubic feet per patient, is enjoined, as also is improvement of the airing-yards. As regards two padded-rooms in course of construction, the report says,—"they ought not to be, and are not, necessary," and that if they were necessary, the position, adjoining one another, would unfit them for use, as apparently intended, for a male patient and a female at the same time,—as there would be a facility of communication attended with inconvenience. These observations should be of service to those who have to plan asylums, or lunatic wards of workhouses. The much-required provision for idiots, is still under the consideration of the Commissioners.

The pressure for increased accommodation for the insane, which continues notwithstanding enlargements of county and borough asylums, is shown by a table which gives the total accommodation in each of the county and in some of the principal borough asylums, and gives also the numbers housed in January last. The number in the latter case approaches very nearly, for the majority of the asylums, to the number designed to be accommodated; or in some few cases, it exceeds. Thus the numbers run:—Beds, Herts, and Hunts Asylum,—designed to accommodate 535 patients; actual number on January 1st, 534;—Bucks Asylum,—350; 301;—Cambridge and Isle of Ely,—320; 299;—and so on, similarly: or, including some where there is overcrowding,—Devon,—673; actual number, 690: Dorset,—419; 411: and Durham, —350; 383.

The only new, completed, county-asylum, of the year, was that for the counties of Carmarthen, Cardigan, and Pembroke, before mentioned, at Carmarthen, and providing also for Haverfordwest. It was opened on the 26th of September. The plan consists of the central block, containing the superintendent's residence, the hall, the chapel, the domestic offices, and the store-rooms; of wards to the east and west; and of two detached buildings containing the workshops and laundry, with wards for patients employed in them. Two receding wings, each for 29 patients, which formed part of the original design, have been omitted. The present accommodation is for 212 patients. The second asylum for the county of Surrey, at Brookwood, near Woking, was not open in March last (the date of the report); when it should have been, by the contract. The asylum consists of a main building, and two detached blocks which are placed diagonally towards the north-east and north-west, of a chapel, a superintendent's residence, farm-buildings, a range of workshops, and gas-works.

The other works, for the counties, completed or advanced a stage, during the year, are alterations or enlargements. At the Cornwall Asylum, Bodmin, a new building for 52 private patients is about being completed this summer. The wards will be of a very superior description; and an ample quantity of land has been set apart for purposes of exercise and recreation. At the Derby County Asylum, at Mickleover, near Derby, the structures called the Infirmary, on the north side of the asylum, are in course of conversion into two-storied buildings; and plans for a large day-room, and for a dormitory suitable for quiet and chronic cases, made in accord-

ance with a suggestion of the Commissioners, have been approved by the Secretary of State. The additional accommodation provided is for 72 patients; and the estimated cost of the works is 3,350*l*.

At the Durham County Asylum, Sedgefield, there seems to have been considerable neglect during the past two years, as to sewerage and water-supply. Eight deaths that occurred in 1864 from diarrhœa and dysentery, were believed to be connected with a cesspool: but the representations of the Commissioners did not receive attention from the Visitors; and in 1865, six patients died from the same diseases. The danger was once more pointed out, but without result. Mr. Lawson, civil engineer, was then directed to inspect, and to report as to the water-supply, kitchen, and laundry arrangements (which appeared faulty), and as to the cesspool. The report substantially confirmed the view that had been taken; and the matter has been referred to the Secretary of State.

One of the most important questions of the year had reference to the extent to which it was advisable to carry the enlargement of an asylum. Some enlargement of the Kent Asylum, with provision of new offices, workshops, and recreation-hall, having become necessary, the manner of effecting the enlargement became the subject of much correspondence between the Secretary of State, the magistrates of the county, and the Commissioners. Strongly disapproving, for reasons repeatedly stated in their Reports, of asylums too large to admit of efficient individual supervision, the Board resisted for some time the scheme suggested, by which addition would be made to the existing building at Barming Heath, near Maidstone, to the extent of providing for its accommodating 1,150 patients; but Sir George Grey, taking into consideration some circumstances of the case, and assured by the magistrates that they would acquire whatever additional land might be pointed out as necessary, eventually gave his sanction. The plans are now under examination, with a view to commencement of the works at the earliest practicable time. The same question had previously been discussed, after pressing demands on the part of the counties of Monmouth, Hereford, Brecon, and Radnor, and the city of Hereford, for increased accommodation in their joint asylum at Abergavenny. The present provision is for 459 patients.. The proposal was to add accommodation for twenty-five female and twenty male patients. The Commissioners advised the Secretary of State to give his sanction in this case, on the undertaking that the Visitors would use their best exertions towards procuring additional land: however, later, another scheme, involving a more extensive enlargement, was proposed: to this the Commissioners objected, and urged the erection of a new building in a different locality. In these objections the Justices of Monmouth concurred, very properly, and refused their sanction to the enlargement. Plans for enlargement of the Northumberland Asylum, at Cottingwood, near Morpeth, are now under consideration. At present the accommodation is for 285 patients.

At the date of the Nineteenth Report, it was proposed to erect a new asylum in Berkshire, for 200 patients from the counties of Oxford and Berks and the boroughs in union. The arrangements being matured, a new Union is to be formed. Oxfordshire, the city of Oxford, and the borough of Abingdon, are to pay to Berks, for the interest resigned in the asylum, the purchase-money of eighty-six beds (the word "bed" conventionally expressing the fee-simple and other property in the asylum), at the rate of 157*l*. 10*s*. per bed; and to Reading, for its entire interest, the purchase-money of twenty-six beds at the same rate. The new Union, which will commence with the year 1869, will be formed for the reception and maintenance in the existing building, at Littlemore, near Oxford, of all the pauper lunatics of Oxford, county and city, and of the borough of Abingdon, and of ninety-five patients of Berks; whilst the Justices of Berkshire will probably join with the boroughs of Reading and Newbury in the erection of a new building.

An eastern wing, which is in accordance with the original design, subject only to certain minor alterations, is to be erected at the Stafford County Asylum, at Burntwood, the estimated cost being 11,107*l*. The Wilts Asylum, near Devizes, (where the present accommodation is for 465 patients,) is to be enlarged at a cost of 1,700*l*., so as to accommodate forty more male patients, the work proposed being a counterpart of that of three years ago, which was for additional female patients. Additions to the Asylum of the West Riding of Yorkshire, at Wakefield, at an estimated cost of 8,000*l*., are in progress. They consist of a detached block for 122 male patients, and of a detached hospital for contagious diseases. Several associated dormitories and day-rooms, and a cheerful, airy, and quiet ward for convalescents, will be gained. The Commissioners at first objected to the enlargement, but ultimately withdrew opposition on the understanding that the proposed new block should be the final limit of extension, and that steps should be taken at once for the erection of another asylum in a different part of the Riding. The asylum at present provides for 1,150 patients.

The asylum for the City of London, at Dartford, has been opened since the date of the Report. It is capable of accommodating 250 patients; and the cost has been 65,000*l*., or thereabouts. Upwards of 30 acres of ground are attached to the building. Arrangements are being made for improved water-supply to the Bristol Asylum, through the purchase of 6 acres of land, dividing the grounds from the river Frome. Plans for an asylum for Newcastle-upon-Tyne, to accommodate 130 patients of each sex, were some time since sanctioned for a site of 50 acres, within two miles of the town. But the works have not been commenced. Neither has any planting of trees, considered necessary in this case to prevent exposure to cold winds.

After considerable difficulty as to procuring a site for an asylum for the borough of Norwich,—and some opposition to the Commissioners, on the part of the town council, on the ground that there was no case made out for change from the existing mode of providing for the insane poor of the town,—the Norwich council have placed themselves in communication with other boroughs in Norfolk and Suffolk, with a view to immediate compliance with the Lunacy Acts by erection of a joint asylum.

The want of adequate statutory provision for the lunatic paupers belonging to boroughs not contributing to county-rates, has occupied much of the Commissioners' attention; and everything has been done to urge compliance with the law. It is now expected that all the defaulting boroughs will, within no long period, make the provision, by the erection of asylums for themselves, or by Union, or such other arrangements as are allowed by the Acts. For the present, the "great inconvenience and injurious effect" of sending lunatics to distant asylums, or licensed houses, continues, according to the Report; but readers of the *Builder* are aware that the existence of asylums, in whatever locality, by no means precludes the removal which the Commissioners seem so anxious to prevent. In short, the Commissioners have been found quite powerless to prevent separation of lunatics from their friends. The practice is most cruel, or very foolish. The Justices of Plymouth have reported as their opinion, that a borough-asylum for that town is required for 200 patients, and that the site should comprise 25 acres,—the cost of buildings and land being estimated at 20,000*l*. The Commissioners approve. The enlargement of the Kent Asylum, before mentioned, will provide for 500 patients from the boroughs of Canterbury, Dover, Hythe, Maidstone, Rochester, Sandwich, and Tenterden. An asylum is about to be erected for the borough of Leicester.

Considerable efforts seem to have been made for the improvement, structurally, of many of the licensed houses; but to these we need not further refer, or to the hospitals, and the State Criminal Asylum. But we may do well to make some further reference to the matter of alterations, of the structural kind, in county and borough asylums, and the designs or drawings for them. It appears that the Visitors of certain asylums have proceeded with improvements or alterations of the character mentioned, and with additions, without submitting their plans to the Commissioners, and getting the approval of the Secretary of State as required by the Act of 1853. This Act directs Visitors to report from time to time to the Sessions of the county or borough, as to the "plans, estimates, and contracts" agreed upon, and the money necessary to be raised and levied; and stipulates for the approval of the Court before the plans are completed or carried into execution. The Visitors are indeed empowered to spend an amount not exceeding 400*l*. in a year, as for repairs. But by the 45th section of the Act, "all plans for building, or providing, or enlarging, or improving any asylum for pauper-lunatics," are required to be submitted to the Commissioners in Lunacy, to be by them reported upon to the Secretary of State, and are not to be carried into effect until approved by him. It is evident that the authority of the Commissioners and the Secretary of State must be enforced, to prevent entire change, in process of time, from the approved arrangements of an asylum,—such change as, in fact, we apprehend, has been made in several cases. The Visitors of the Hull Asylum, thinking fit to dispute an opinion of the Attorney and Solicitor General, taken at their own suggestion, as to the power to control them, a mandamus was applied for. However, in this instance, the result was adverse to the Commissioners: the decision of the Lord Chief Justice showed that the plans were to be submitted "prior to the commencement of the works," and that "they could not compel it to be done after the completion of the works." But to show how the matter really is, one case may be here cited. Last year there were considerable structural additions to the Somerset Asylum, at Wells, for which no plans had been submitted at first. They included an additional wing, and the enlargement of a cottage for male idiots; and the idea seems to have been, that as these additions were paid for without a county-rate, they were exempt from compliance with the section of the Act. The Commissioners were able to show that the obligation to submit plans always remained in force. Eventually, approval was certified, accompanied with a remark of the Secretary of State as to irregularity of the proceeding in commencing.

We have before suggested that these Reports of the Commissioners in Lunacy should be accompanied by plans of the asylums and new works. Without them, the description is seldom so clear as it should be: indeed, it cannot be clear. Besides, published plans would help to prevent the unauthorized structural changes. The descriptions, if left only written, might be improved. Thus, cost of the structure might be clearly distinguished from the cost inclusive of ground and architect's commission: the number of patients accommodated, or to be provided for, should be given in every case, instead of only in some cases; and the building-outlay per patient should be clearly seen. Surely, also, names of the architects of the buildings might appear generally.

BROADSIDES *versus* TURRETS.

THE science of war at the present time is in the unusual condition of being appealed to for the principles on which operations of unprecedented magnitude are to be conducted, at the very time that the main element which regulates the relation of attack and defence is undergoing rapid change. The great attention that has been given to the construction of projectiles, since Europe shook off her peaceful dream of forty years' duration, has not only produced results of the first importance, but promises so continued a development of offensive power, that the main military expenditure of a state is now incurred for objects which, in a few years' time, may be almost or altogether obsolete. No state can await the result of experiment, or the more slow progress of experience, at the risk of being attacked by an enemy possessed of an armament which, if far from theoretic perfection, is yet considerably superior to her own in offensive power. But the waste of expenditure incurred in putting a country into what may be called a provisional state of defence, is enormous; and it is not surprising that those who are responsible for military expenditure are inclined, as long as possible, *stare super antiquas vias*.

While, then, we would be the last to underrate the importance of the long series of experiments that have been conducted by the British Government, which, if as yet unsatisfactory as to the determination of the best gun, or rather of the best normal series of guns for field, for siege, and for naval service, have at least given most important and satisfactory results in connexion with the manufacture of armour plating, we think that the actual experience of the engagements of the present time has far more interest for the civil or military engineer. Nor is the interest confined to the professional man alone, any more than the desire to be a crack-shot is confined to the professional soldier. The public and patriotic spirit which, by the organization of our volunteers, has probably saved this country from insult, and has certainly caused it

to be regarded in a very different light on the Continent, regards not the perfection of a single arm, but the efficient protection of our native country; and whether it be the practice and evolutions of rifle corps, the range and aim of the heavy ordnance, or the construction of the best forts for the defence of our ports and harbours, each contribution to our actual stock of knowledge will be eagerly hailed by every thoughtful man.

The results of the sanguinary experience of the Crimean, the Italian, and the Danish wars, together with those of the more gigantic struggle on the opposite shores of the Atlantic, can hardly be said to be clearly apprehended by military students at the moment that the hoarse voice of the dogs of war may be hourly expected to startle the reluctant ears of Continental Europe. The main points which may be held to be certainly established, are, the increased importance of the utmost rapidity of manœuvre, so that troops may be exposed for as short a time as possible to a fire of greatly augmented range and precision, the consequent depreciation in value of heavy cavalry, and to some extent of grenadier regiments, and the alteration in value of once famous strategic points, which now can be commanded from stations formerly out of range, or can be shelled by the heavy mortars that are now borne by floating batteries of various descriptions. For our own particular information, however, as inhabitants of a country in which the defences of ports and harbours is an object of paramount importance, the question of the relative power of land and of floating, sea-going batteries, under whatever name they may be designated, including the capabilities of the guns that are mounted in either case, is of the first and most prominent value.

In this part of the field we have done, and are doing, much, although it is open to very serious question whether, after all, our efforts are bent in the right direction; and the most recent conflict, of which the particulars have reached us, affords an experience not lightly to be disregarded. Nothing is more clear from every naval engagement in which iron-clads have taken part, than the fact that the number of vessels comprising a fleet is now of far less importance than the actual constructive strength of the principal vessel on either side. With wooden vessels, perhaps with the more slightly cuirassed iron vessels which were first launched, numbers stood for much, if not for all. The material damage caused by the broadsides of contending fleets balanced to the one side or to the other pretty much in the ratio of the number of guns. As in the contests of pugilists, each side could give and could take a certain number of blows, and he who could hit oftenest, even if he could not hit hardest, won. But now the case is altered, and it is as in the famous race, when *Eclipse* was first and the rest nowhere. If there be present in any naval engagement, whether it be a sea-fight or an attack on a land-port or harbour, one vessel of skin thick enough to resist the shot of the enemy, and of guns powerful enough to pierce their opponents, it can crush them successively and in detail; and the greater the number of the over-matched combatants the greater the slaughter among them. The present rough rule of proportion is, that the diameter of the bore of the gun should equal the thickness of the armour-plating of the vessel. Thus our latest design, the *Hercules*, which is now being built at Chatham, has the central part of the vessel protected by armour-plates of 9 in. in thickness, and is, *in this part of her structure*, invulnerable to any shot or shell from rifled guns of bore not exceeding 9 in.,—the size of the largest guns which she herself carries. It might be thought, then, that the *Hercules*, presented the *ne plus ultra* of the science of naval artillery, and, like the armour-cased knight of old amid the leathern-coated mob whom he could slaughter at pleasure, might enter into any engagement with a certainty of victory; but it must be remembered that this invulnerable skin is confined to the central portion of the ship. The power of flotation is not adequate to support a total armature of that prodigious weight. Nearly 160 ft. in length by 9 ft. in breadth in the *Bellerophon*, and the fore and aft parts of the ship in the *Hercules*, and all similar vessels, is pervious to shot and shell from even an ordinary boat's gun. The confidence, therefore, to be placed in the impervious armour and powerful ordnance of the central battery is diminished in a degree not readily calculable by the power of the enemy to cripple, water-log, and clear of defenders the unarmed portions of the ship; and the value of the turret or Monitor form of vessel, so unaccountably neglected by our Admiralty, appears enhanced by the visible defects of this last and most costly effort of our dockyards. The turrets of the *Royal Sovereign*, a vessel not constructed, but only converted, for an experiment, are of 10-inch plates, and are said to be capable of carrying and working guns of double the weight of the 12-ton guns actually mounted. The circular form of the turret increases the power of the side to deflect shot, and there can be but little doubt that, if they were pitted against one another, the *Royal Sovereign* would send the *Hercules* to the bottom. In what terms can the conduct of the First Lord of the Admiralty, who allows our vast expenditure to arrive at such a lame and impotent result, be duly characterised. In a despotic country, where the responsible man would actually and disagreeably be responsible with his head, such an application of the resources of the state would be impossible, in face of the experience of the present day; and we can only devoutly trust that no unexpected incident of the pending European contest may awaken the people of this country to the wide difference between the parliamentary responsibility of a board, and the actual responsibility of an efficient minister.

It was the saying of a great wit that railway travellers would never be safe till a bishop had been burnt in an accident. If those who directed our armaments were bound to take a foremost position in case of attack, we should, no doubt, have had by this time a fleet of Monitors afloat. The wish of the satirist has just met with its fulfilment, *mutatis mutandis*. The Peruvian Minister of War and Marine, Signor Galvez, has been blown to atoms while actively superintending, in an iron-clad battery, the defence of Callao from the wanton and unsuccessful attack of the Spanish fleet. It would seem, from the best account that has yet reached us of the action, that of the American commodore, that this serious and lamented loss arose, not from the guns of the Spaniards, but from the accidental ignition of a shell. The example of the soldier-minister was in emulation of that of the Dictator, who was "everywhere in the thickest of the fight, animating, encouraging, and directing the Peruvian batteries."

The lessons to be drawn from the recent cowardly and unmartial conduct of Spain, while awaiting that retribution that will probably not be very long deferred, are neither insignificant nor unimportant. The first is, the proof how very little the ordinary rules of civilized warfare, the claims of justice or of humanity, or the public opinion of Europe, avail to check the action of those who, by the command of an armoured fleet, find themselves able to insult or to destroy a great commercial emporium belonging to a people whose prosperity they may, or with whom they have picked a quarrel. The second, and not less noteable one, is, that a Monitor is a sea-going vessel. The American commodore had a turret vessel off Valparaiso as well as off Callao, and appears to have been convinced of his ability to give a good account of the Spanish fleet, including the iron-clad *Numancia*, of 7,000 tons burden. The third inference is not less striking, and points, as does almost all the practical information that we have been able to collect, to the great advantage of the turret form of battery. The Peruvian Monitor, the *Thesoa*, was struck ten times by Spanish shot, and received no damage. It does not appear what part her 68-pound gun took in the action, but the real key of a gallant defence that, to the satisfaction of the civilized world, drove off the buccaneering Spaniards, and saved Callao from the destruction of the undefended Valparaiso, was the position of four 300-pounder Armstrong guns, mounted in iron turrets. There were also five 450-pounder Blakely guns, as well as thirty-six 32-pounders; but as these were mounted *en barbette*, and thus exposed to the shell of the fleet, losing eighty killed and wounded, there can be but little doubt that the gratifying result of the defence was mainly owing to the use of the turret battery.

The information as to which we are in possession as to the Spanish fleet is not so full as we could desire. Six frigates and a three-gun corvette are mentioned by Commodore Rodgers, but the admiral was on board the iron-clad *Numancia*, of 7,000 tons burden, armed with 68-pounders, a vessel which, from its description and burden, must be considered as not unfairly representing the broadside iron-clads on which our Admiralty at present relies. The Spaniards kept at a respectful distance from the batteries, many of their shots falling into the water. The American commodore charitably suggests that "the presence of torpedoes may have inspired caution." That the presence of batteries, unfortunately absent at Valparaiso, inspired caution, is also tolerably evident. The result was, that the Peruvian batteries were but little injured; but the loss was heavy to the Spanish fleet. "It was obvious that several of the vessels had been badly punished." An hour and three-quarters after the first gun was fired by the *Numancia*, the *Villa de Madrid* set her jib and try-sails, and was out of the fight. She made signals, and was taken in tow by the *Vencidora*, with steam escaping abundantly below. She was soon followed by the *Berenguela*, listed over to one side, and with smoke pouring from her ports. Just before she retired a puff of black dust had shot out at her water-line on the side away from the batteries. A ball, the Commodore thought, had gone through the coal-bunkers, and through both sides, and men were seen over the sides attempting to patch with canvas the ragged hole, which seemed some two feet square. There is not much in this description to take the engagement out of the category of a timid attack by ordinary frigates on a port defended by batteries, but great significance is due to the fact that the Spanish admiral was badly wounded by splinters,—a circumstance which proves that, whatever might have been the exchange of shot between the frigates and the lighter guns of the batteries, the *Numancia* was actually engaged, was beaten off with loss and damage, and made no impression either on the Monitor *Thesoa*, or on the iron turrets of the fortifications.

We have, therefore, before us the result of an experiment of the utmost interest and importance, which our repudiating debtors have kindly conducted at their own expense for our especial benefit and information. Lightly viewed, the experience would be cheaply purchased by our naval constructors at the price of a very large nominal amount of "Spanish passives." If we have not every particular of the experiment arranged with as much precision, or noted with as perfect accuracy, as are those on board the *Thunderer*, we must remember the cogent reasons for some degree of hurry and inexactitude on the part of the artillerists. But it cannot be denied that we have an instance of the engagement of a broadside iron-clad, with turret guns, in actual warfare, and of the defeat of the former. The importance of such a result, considering the present state of our iron navy, and the present rules of our constructors, cannot be easily over-estimated. One thing is pretty sure, and that is, that if we do not take the hint and derive from this great lesson the information it affords, some of our neighbours will be less supine. If orders are not given at Somerset House, within a few hours of the receipt of the report of Commodore Rodgers, for laying down the lines of one or two turret vessels, we shall not be surprised if in a country where the individual who directs both land and sea forces is fully conscious that he cannot afford to suffer any check or affront from the superiority of our own or any other navy, no time should have been lost in taking advantage of this new and precious instalment of positive scientific evidence on one of the most important questions of modern warfare.

On the apparent eve of a mighty struggle, of which no man can foresee the upshot or calculate on the incidents, it is of vital importance to this country to be in a position to cause her neutrality to be respected. On this point it is needless to argue. It is universally admitted, and not only so, but has been acted on, and is yet being acted upon to an extent involving the expenditure of many millions. The sole point on which we have to insist is, that these millions should be spent in an efficient manner, and, if possible, in the most efficient manner. It would appear *à priori* to any man of mechanical aptitude that the mode of protecting our engines of offence which affords the least mark to hostile projectiles, and in which the least weight of defensive armour can be disposed in the most perfect and economic form, is the mode which we should seek to perfect. This mode, however, we have neglected. Our sole experiment, by no means a discouraging one, should be fully carried out. We have listened with a contemptuous and incredulous smile to the opinion of the artillerists and naval men of America that their powers of marine offence are superior to our

own. At the expense of other people we are now in possession of the results of an experiment that speaks strongly as to the great advantage of the Monitor or turret form of marine battery. What further is required by the Admiralty before they will act on so plain and so reiterated a warning?

It is on the professional and scientific journals that the duty of raising a warning voice on matters of this nature seems almost exclusively to fall. Two or three of our contemporaries alone agreed with us when we pointed out the great error committed by the Admiralty in completing the armour of the *Northumberland* before her launch; although to the mechanical reasons, the neglect of which caused so much delay, expense, and risk of worse disaster, there might have been added the hopeless muddling of the magnetism of the vessel.

The smaller, but more specially instructed, body of readers who form the public addressed by scientific papers, are competent fully to weigh, and maturely to reflect on, considerations such as we have now advanced, and it is to the informed and matured opinion of such readers, rather than to the more easily excited and less permanent attention of the larger masses, that we must look for the exertion of that influence that shall overcome the reluctance of our naval constructors to avail themselves of the lessons of a costly experience, or to adopt the method of an unpopular inventor, for the plain and simple reason that it happens to be the best.

Since the above remarks were in type, the turret ship, the *Royal Sovereign*, has been subjected to the most rude and violent test to which, as a scientific experiment alone, the work of human hands has, as far as we are aware, ever been exposed. Three steel-headed shot, of 246 lb. and 250 lb. weight, each propelled by 43 lb. of powder, have been fired from a 9-in. rifled gun, weighing 12¼ tons, point blank at one of the turrets of this experimental Monitor when actually afloat, at distances of 200 yards and of 160 yards. After these three terrific blows the Monitor was so far uninjured that the turret revolved as freely as before. Some damage was effected, in ploughing out slices of iron, and in stripping the heads of bolts, and the wooden "quaker," which replaced for the time the heavy gun which the turret was intended to carry, was shivered by the concussion; but the vessel was in the main uninjured, and so, it seems, would have been the crew, if on board. It is impossible for any occurrence to confirm more strongly the views which we have above expressed.

It must be remembered that the *Royal Sovereign* is far from being such a turret vessel as we can now produce. The arrangement for the revolution of the turrets has answered admirably, but we must not commit the defence of our waters to 4½-in. or 5½-in. armour plates. There can be little difficulty, even now, in producing cast-steel segments of 14-in. or 18-in. thickness, with half-lap or dovetail joints, and with bolts formed with a tapering head, tapped or riveted into the segments, so as to avoid the flying of the nuts. Turrets so constructed would defy any shot as yet projected from a floating battery. Nor does it seem incredible, considering the great advances we are daily making in metallurgy, that the same energy which has so far perfected the Whitworth gun may present us with a steel turret, cast in one piece under pressure, a floating tower of defence on which the thickest storm of hostile shot that we can as yet think it necessary to provide against would fall but as hailstones on an oak.

THE QUANTITATIVE ANALYSIS OF THE BEAUTIFUL AND ELEMENTS OF HARMONIC PROPORTION.

THE determination of the principle of the beautiful was the incentive to those inquiries which have terminated in the development of the central science. Having a scientific bias, I desired to bring criticism from the ever-shifting clouds of fancy to the solid ground of positive science. Some of my readers on former occasions, I know, thought I was doing the very reverse by seeking confirmation of a theory of the beautiful in planetary phenomena; others because they erroneously supposed I had got into the misty region of metaphysics. But feeling confident that I was endeavouring to grasp the purpose of nature and the exact principle of the beautiful by the method so productive of useful results in the present century, I was proof against sceptical smiles and shrugs. It is not every one to whom the treatment of a subject appears mystical who has a right to say it is really so. To many the enunciation of a simple geometrical or algebraical formula, the clearest of the clear to the initiated, would be an unintelligible mystery. But perhaps I may have been obscure from lacking power over language to express what appears perfectly clear to my own mind. In this final lecture of the series on formative ethics, however, I hope to be more lucid, and that you will discover much of the matter,—thought to be so remote from the end of my inquiries on former occasions,—to be closely connected with it in principle. There is, I must confess, some difficulty in accurately defining the range of phenomena to which the title of "Beautiful" is properly applicable. The common use of the word is exceedingly vague and lax; sometimes being extended so as to include everything that pleases a good taste, and so comprehending grandeur and novelty, as well as what, in a more restricted sense, is called beauty; at other times, being even by good authorities confined to the objects of sight, when they are either seen, remembered, or imagined: yet it is applied to music, to composition in prose and verse, and to character, affections, and actions. These are not objects of sight, and a man could thus be a judge of some kinds of beauty without the faculty of seeing. To fix a determinate meaning to a word so variously extended and restricted, I propose to use the term "beautiful" in this lecture, first, in direct reference to a condition of the human form; and, secondly, in reference to those relations of inanimate phenomena in colour, form, sound, and motion, to which it also may be safely applied. From its application to the perfect, or what for the time being is thought to be the perfect, human form, it easily passes in common use to all that affects the human sense, either agreeably or in the best way; but here limitation is impossible, and we are compelled to acknowledge the propriety of the restrictions we have just imposed.

Now, for the present, I assume the most beautiful human form to be identical with that which reason would approve the best; to be identical with that human form which completely embodies the idea of perfect mental and physical conformation—of perfect fitness to the highest human destiny, and, in a more restricted sense, with the best form of a race. But if the beautiful be only another term for the perfection point of the human species, might it not be as appropriately applied to fitness throughout nature? It might with general consent, but present usage would revolt at the idea of calling the fittest of porcupines or of gorillas, beautiful. According to our present use of language, then, it will be perceived that it is only *some*, not all fitness which may be called beautiful. There may be fitness without beauty, but never beauty without fitness, to human sense. This is a distinction which very much clears the ground for the discussion of the beautiful. And we now pass on to review the premises on which the quantitative theory of the beautiful is logically established.

1st. On the conclusion of the metaphysical or transcendental philosophy, that the fundamental forms of consciousness are space and time.

2nd. On the conclusion of positive science that the fundamental form of phenomena is force in extension and duration, or, in other words, force in space and time.

The foregoing conclusions are in brief those of the two rival systems or schools of thought, in which you will at once perceive there is a common point of agreement, for the space and time of the metaphysician, and the force, space, and time of the positive philosophy are quantifiable. Quantity, therefore, is really the fundamental or ultimate form of both systems. The professed object of positive science is, as I dare say you are aware, the reduction of its knowledge to the definite expressions of measure and number. Astrology was the first to succumb to this method, to the disenchanter positivism, and to become the precise science, astronomy. Alchemy, by the same process, became the science of definite proportions; and the theories of light, heat, electricity, &c., are daily assuming definite quantitative statements; and they who may be accustomed to close reasoning will perceive that the quantitative theory of the beautiful is virtually established on the common premise of the two systems to which we have just directed notice, and that it is as capable of being brought within the pale of exact science as the theory of music, which is entirely one of definite proportional relation, and be as capable of deductive application.

But let us reconsider the subject from a point of view less remote from the ordinary compass of reading and current of thought. Reflect for a moment and you will come to the conclusion that the phases of the artistically beautiful are three, viz., colour, light, and shade, and form: and what is colour but force in extension and duration—active vibrating light of which the velocities of the different rays have long since been accurately determined? All the differences in colour are therefore of intensity and extent, which may be expressed by ratios. The beautiful in colour, then, is inseparable from definite quantitative relation.

2. Light and Shade.—The preceding analysis of colour includes and decides the question with reference to this second phase; and the tempering of the forces of light by absorbent surfaces, the graduation of reflecting surfaces in sculpture, and the combination of spaces of light and dark, are all adjustments of quantity. Here again, then, the theory is maintained.

3. Form.—All forms, be they beautiful or ugly, exist in dimension; not the slightest change can take place in face, form, characteristic, or type without a change of relative measures, *i.e.*, quantities. This is the third and last phase we had to examine; and in this, also, the quantitative theory holds good: we may therefore conclude that the beautiful is inseparable from some definite quantitative relations.

Now let us see whether the method adopted to determine truth in other branches of inquiry, viz., the system of averages, be applicable to our purpose.

"By its means," writes Sir J. Herschel, "we are enabled to conclude the value of that which we do not see with greater certainty than that of quantities which we actually see and measure. It is the useful and valuable property of the average of a great many observations, that it brings us nearer to the truth than any single observation can be relied on as doing, and which renders it the most constant resource in all physical inquiries *where accuracy is desired*."

Now, having determined the fundamental form of the beautiful, as of other phenomena, to be quantitative, it is equally applicable to the determination of truth in this respect. We have then to obtain the average proportions of the greatest possible number of individuals of any race of mankind to determine the measures of its true, mean, essential, perfect type; in other words, of its moral, ideal, or central form, about which it may fluctuate or oscillate through erratic conditions, but from which, in the aggregate, it can never depart but to become extinct. Now this true, or central, must also be the beautiful type of a race; for any other set of proportions would lie out of those of rectitude, of truth, and would in some degree or other be disproportioned, imperfect. The beautiful, therefore, is only a special title for the perfection point of a certain class of phenomena occupying an analogous position to the same point in any class of phenomena. If this be the case, then, the *mean* is the common measure of rectitude in nature; as we have already shown, by a wide interrogation of science, is actually the case; and, in demonstrating the *mean* to be the quantitative expression for the beautiful, another proof is added to the instances already adduced, tending to confirm the universality of the principle. I showed you on a former occasion that the *mean* distances, orbits, and periodic times of the planets are immutable; that the *mean* sidereal day has not varied a thousandth of a second since the time of Hipparchus; that the *mean* annual amount of light and heat received from the sun is constantly the same; that the *mean* or temperate zones are the permanent homes of civilization; that in these man attains his best development morally, intellectually, and physically; that Aristotle's ethics are founded on the *mean* as the principle of rectitude; and, above all, that we have a higher guarantee of the universality of the principle in Christian ethics which yield this emphatic precept, "Let your *moderation* be known unto all men."

Does not modern science obtain her most valuable results from the method of averages? Which could not be the case if the law of compensation were not inviolable, if every phenomenal fluctuation in excess were not compensated by an opposite one in defect; and thus, on account of a fixity in the *mean* duration of human life, life assurance becomes practicable. Does not man throughout the world seek by artificial means, by building, clothing, ventilating, to preserve *mean conditions* under all the

vicissitudes of climate? Do not the poets love to extol the *mean* seasons of spring and autumn, and, to vivify the precepts of philosophy, sing of the Golden Mean? From Spenser we have the following appreciation of the great truth:—

"The antique world, in his first flow'ring youth,
Found no defect in his Creator's grace,
But with glad thankes, and unreproved truth,
The gifts of soveraine bounty did embrace;
Like angels' life was then men's happy race;
But later ages pride, like corn-fed steed,
Abused her plenty and fat swolne encrease
To all licentiousness and gan exceed
The *measure of her meane* and natural first need."
Canto VII.

From Shakspeare we have:—

"Nature is made better by no *mean*,
But nature makes that *mean:* so that the art,
Which you say adds to nature, is an art
That nature makes."—*Winter's Tale.*

And on the law of compensation:—

"So every scope turn'd to immoderate use,
Turns to restraint."

From Pope:—

"Avoid extremes, and shun the fault of such
Who still are pleased *too little* or *too much*."

With all this accumulated evidence, is it derogatory to the principle of the beautiful that it should be one common to all excellence? and one which, though little understood, is, perhaps, the most ancient of all the scientific truths we possess? I think you will agree with me that it is not.

The beautiful, then, lies in the *mean;* for if it did not it would inhere in excess or defect, in some imperfect disproportioned individual instance, which is absurd. Consider for a moment, and you will perceive that you unwittingly express yourselves, in common conversation, in perfect accordance with the quantitative theory; for you will find that your criticism and censure always fall on what you consider to be *too little* or *too much*. I am not speaking of your criticisms upon art only, but upon all conduct and action. How, then, can you fail to see that your ideal lies between this too little and too much, this excess and defect? Nay, you must have instinctively fixed a *mean* in your judgment in all these matters, or you could not predicate the *too much* or *too little* of them. You find, then, that you are all quantitative philosophers without knowing it, and all that education and science can do is to rectify erroneous ideals,—wrong *means*.

The metaphysical philosophy declares the fundamental form of consciousness to be quantitative; the positive, that the fundamental form of phenomena is quantitative. The mental and physical ideals should, therefore, be co-ordinate; that is to say, if the mean be the measure of the one it should be the measure of the other. And it requires but little acumen to perceive that the platonic doctrine of ideas resolves itself into that of average or essential forms.

I do not stand alone in thinking the *mean* to be the measure of the beautiful; it was surmised independently of any considerations such as have been submitted to you in former lectures, and which lead to the conviction that it is the common measure of rectitude in the solar system. Dryden, Hooker, Du Fresnoy, the Père Bouffier, Hogarth, Sir Joshua Reynolds, had all, more or less, keen perception of this metric principle in reference to the subject in hand. I hope, however, to be entitled to the credit of having removed the theory from the region of guesswork and opinion into the circle of established science. Dryden appears to have had a glimpse of the theory and of the immutability of the measure of the beautiful.

"There is," he writes, "a *mean* in all things, and a certain measure wherein the good and the beautiful consist, and out of which they never can depart." So had also the judicious Hooker, who thus expresses his conviction:—"Measure is that which perfecteth all things, because everything is for some end; neither can that thing be available to any end which is not proportionate thereunto; and to proportion, excesses, as well as defects, are opposite." And Du Fresnoy, recognising a metric principle common to the good and the beautiful, says,—

"Right ever reigns its stated bounds between,
And taste, like morals, loves the golden mean."

Hogarth, too, had a glimpse of the great truth, and in his "Analysis of Beauty" thus endeavours to express his convictions:—

"Let us try," he writes, "to get a clear idea of what constitutes or composes the *utmost* beauty of proportion; such as seen in the Antinous, which is allowed to be the most perfect in this respect of any of the antique statues; and, though the lovely likewise seems to have been as much the sculptor's aim as in the Venus, yet a manly strength in its proportion is equally expressed from head to foot in it; and as this masterpiece of art is so well known, we will set it up before us as a pattern and endeavour to fabricate, or put together in the mind, such kind of parts as shall seem to build another figure like it. In doing which, we shall soon find that it is chiefly to be effected by means of the nice sensation we naturally have of what certain *quantities* or *dimensions* of parts are fittest to produce the utmost strength for moving or supporting great weights, and of what are most fit for the utmost light agility, as also for every degree between these *two extremes*. * * * * *

Having set up the Antinous as our pattern, we will suppose placed on one side of it, the unwieldy elephantine figure of an Atlas, made up of such thick bones and muscles as would best fit him for supporting a vast weight, according to his character of extreme heavy strength. And, on the other side, imagine the slim figure of Mercury, neatly formed for the utmost light agility, with slender bones and taper muscles, fit for nimbly bounding from the ground.

Our *extremes* thus placed, imagine the Atlas throwing off by degrees certain portions of bone and muscle proper for the attainment of light agility, as if aiming at the Mercury's airy form and quality; whilst, on the other hand, the Mercury augmenting his slim figure by equal degrees, and growing towards an Atlas in equal time, by receiving to the like places from whence they came the very quantities that the other had been casting off; when, as they approach each other in weight, their forms may, of course, be imagined to grow more and more alike, till, at a certain point of time, they meet in just similitude; which, being an *exact medium* between the two extremes, we may thence conclude to be the precise form of exact proportion fittest for perfect active strength or graceful movement, as the Antinous we proposed to imitate and figure on the mind. * * * *

In like manner, any two opposite colours in the rainbow form a third (or a mean) between them, by thus imparting to each other their peculiar qualities; as, for example, the brightest yellow, and the lively blue that is placed at some distance from it visibly approach, and blend by interchangeable degrees, and, as above, temper rather than destroy each other's vigour, till they meet in one firm compound, whence, at a certain point, their original aspects are quite lost; but, instead a most pleasant green, is found the colour nature hath chosen and of which the eye never tires."

Sir Joshua Reynolds expounds the same principle in reference to the beautiful, and with an inkling of its universality and immutability: and its immutability is a necessary adjunct or correlative of its truth; for it would be useless to concern ourselves about rectitude, perfection, and beauty, to-day, if their principle could be changed to-morrow; in fact, I doubt whether we should have any ideas on the subject, unless the measure of rectitude were eternally fixed.

The mean was designated the immutable by the Chinese philosopher, Confucius, and modern science is daily confirming the appropriateness of the title; and the law of rectitude is that which we should naturally suppose would, of all others, be immutable as the immediate fiat of the Divine will. The belief in the fixity of a principle is alone consistent with that in its Divine establishment. This was, indeed, the conviction which led me to seek and to readily find the great central law enshrined in the Scriptures; for truth, no matter from whence derived, could not be inconsistent with truth. The mean, the law of rectitude, perfection, and beauty, is an expression for a Divine truth revealed through nature. It is a revelation from the same source, but a different channel,—as the Word. It is a revelation which might again be derived through experience, were even the records of our present faith, as well as of science, to be lost in some convulsion of civilization.

"The Italian painter," says Sir Joshua, in his discourses, "attends only to the invariable; the great and general ideas, which are *fixed* and *inherent* in universal nature. It is *the invariable general form* which Nature always seems to intend in her productions. Thus, amongst the blades of grass, or leaves of the same tree, though no two can be found exactly alike, the general form is *invariable*. Every species of the animal as well as the vegetable creation may be said to have a fixed or determinate form, towards which nature is continually inclining, like various lines terminating in the centre. For instance, in a particular part of a feature, the line that forms the ridge of the nose is beautiful when it is straight; this, then, is the *central form*. In creatures of the same species, beauty is the *medium* or centre of all its various forms.

It is from a reiterated experience, and a close comparison of the objects in nature, that an artist becomes possessed of the idea of that *central form*, if I may so express it, from which every deviation is deformity. Every object which pleases must give us pleasure upon some certain principles, and a man finds them out, not by felicity or successful hazard, but by care and sagacity.

To the principle I have laid down, that the idea of beauty in each species of beings is an invariable one, it may be objected that in every particular species there are various *central* forms, which are separate and distinct from each other, and yet are undeniably beautiful; that in the human figure, for instance, the beauty of Hercules is one, of the Gladiator another, of the Apollo another, which makes so many different ideas of beauty."

"It is true, indeed, that these figures, are each perfect in their kind though of different characters and proportions; but still none of them is the representative of an individual, but of a class. And as there is one general form, which, as I have said, belongs to the human kind at large, so in each of these classes there is a common idea and *sub*-central form, which is the abstract of the various individual forms belonging to that class. Thus, though the forms of childhood and age differ exceedingly, there is a common form in childhood and a common form in age, which is the more perfect as it is remote from all peculiarities. But, I must add, farther, that though the most perfect forms of each of the general divisions of the human figure are ideal, and superior to any form of that class, yet the highest perfection of the human figure is not in any one of them. It is not in the Hercules, nor in the Gladiator, nor in the Apollo, but in that form which is taken from all, and which partakes equally of the activity of the Gladiator, of the delicacy of the Apollo, and the muscular strength of the Hercules. For perfect beauty in any species must combine all the characters which are beautiful in that species. It cannot consist in any one to the exclusion of the rest; none must, therefore, be predominant, that none may be deficient. There is likewise a kind of symmetry, or proportion, which may properly be said to belong to deformity. A figure lean or corpulent, tall or short, though deviating from beauty, may still have a certain unity, on the whole, not unpleasing."

This, Sir Joshua more forcibly expresses in a letter to the *Idler*. After stating that "The black and white nations must in respect of beauty, be considered as of different kinds, at least a different species of the same kind, from one of which to the other," he observes:—

"No inference can be drawn," and then continues, "From what has been said, it may be inferred, that the works of nature are all equally beautiful, and that preference is given from custom or some association of ideas; and that, in creatures in the same species, beauty is *the medium* or *centre* of all its various forms." He concludes thus:—"If it has been proved that the painter, by attending to the invariable and general ideas of nature, produces beauty, he must, by regarding peculiarities, and accidental discriminations, deviate from the universal rule, and pollute his canvas with deformity."

From these several quotations, it will be seen that Reynolds not only recognised the *mean* or central form as the ideal standard of a genera, but the sub-central forms as the sub-ideals of species. For if the perfect mean form of humanity be departed from but a tittle, the law of compensation immediately operates and produces characteristic peculiarities which may be classified. If the vital force be turned awry to any undue development, in any special direction, it must be by denial in some other direction, in some other quality,—ponderous strength at the expense of agility,—extreme agility at the expense of power and endurance,—extreme cerebral development by the loss of physique,—extreme muscular development by the deprivation of brain or power of thought. In vital as other mechanics, power may be dissipated in velocity, or velocity concentrated into power, but what is gained on one side of the *mean* will be lost on the other.

That something further should be attempted by way of determining the principle of the beautiful is the more necessary, as the late president of the Royal Academy dismissed the theory of Hogarth and Sir Joshua which I am endeavouring to establish on a wider basis, in words to this effect:—"That, if beauty lies in the mean, it is the average of deformity;" but there is really no *ad absurdum* in this argument, but in the supposition that it is conclusive against the theory. The passage recently quoted from the "Outlines of Astronomy," shows that truth does come out of averages of errors: that it does so is consequent on the fact that errors are but of two kinds, of excess and defect, and thus, in an average struck from a great number of instances, the plus and minus false quantities neutralize each other, and yield *the balanced mean of truth*. That a further demonstration of this theory was needed is also shown by critics abandoning the principle of the beautiful as one incapable of being solved, as may be gathered from a recent article in one of the quarterlies; and precisely on a point to which this theory affords a satisfactory answer, viz., the differences in the standards of beauty of different races. That the solution of a question having reference to phenomena as tangible as any other investigated by science, should be abandoned, has always appeared to me to arise from sheer indolence; from that enervated tone of mind which comes of long prosperity, and which pronounces things impossible of attainment which require any exertion to think them out; or, from that still more wretched state of mind which fancies there is something more divine in mystery than the clear truth; or, still worse, that imbecility which pronounces a thing unknowable because it does not itself know it. If the principle of the beautiful could not be defined, we should be for ever critically blind. To entertain such a notion is certainly unscientific, not to say profane; for if the beautiful is synonymous with the perfect human form, as we have shown it to be, an unfailing source will not leave us in the dark as to its principle.

Now the conformation of the divine human is thus expressed in the New Testament:—He who "is the image of God" "was made in the likeness of men;" both of which expressions imply perfect manhood; the first by directly affirming His conformity to the divine idea; the second by

affirming conformity to the abstract likeness of men: mark, not in the likeness of any human being, but in the likeness of humanity, having all the essential elements which the *mean*, central, or moral form alone expresses, and which can alone be embodied in perfect or divine humanity. It is only the thorough understanding of the quantitative theory in connexion with the preceding texts that will enable us to fully appreciate the import of the injunction of St. Paul,—"Therefore, let us go on unto perfection, till we all come in the unity of the faith and the knowledge of the Son of God unto a perfect man, unto *the measure of the stature* of the fulness of Christ." Here, then, we have a full confirmation of all that science teaches upon this subject; and the foregoing texts are but a few of many that could be brought forward to prove that the perfect, which is also the beautiful, in the human form, has its established measure,—"*the measure of the stature of the fulness of Christ*," which, I think, has now been conclusively determined to be the Golden or Immutable Mean.

W. CAVE THOMAS.

CENTRAL COTTAGE IMPROVEMENT SOCIETY.

THE offer by this Society of two premiums (10 guineas and 5 guineas) for the best and second best design for a detached cottage, not exceeding in cost 100 guineas, has brought 112 designs, and these are now on view in the meeting-room of the Society of Arts. The stipulations as to sizes and requirements were precise, so that the scope for the designer was narrow. To comment on the drawings sent would be useless. It may almost be said that whatever is good in them is old, and that whatever is new in them is not good. There are several that would make convenient and compact cottages: for example, 84, "Can more be done for the money?"; 48, "How do you like it?"; and 47, "*Labor et Honores*." The last has a better elevation than 48, and would probably cost more money. 62 (a blue triangle) is a neat cheap plan. "*Palma non sine pulvere*" has a pleasant elevation, but would be expensive. The judges, in awarding the premiums will have to consider minute differences.

Two of the competitors contemplate the use of concrete for the walls. One of them, No. 4, "Speed the Plough," submits a fair plan. The other absurdly proposes to make the building circular,—like an old dove-cot or a slice of a round-tower. By the use of this material a considerable saving might be effected in some neighbourhoods. Cottages are being built with it at Bexley Heath, by means of Mr. Tall's apparatus for the purpose, which well deserves the attention of all who are interested in the matters. Some particulars will be found in our advertising columns.

Returning for an instant to the Cottage Improvement Society, we would mention, that Mr. Martin, the secretary, will be found in the room, and will give any information that may be required as to its operations and views.

A CHAPTER OF ACCIDENTS.

IT is melancholy to reflect on the enormous sacrifice of human life which we are every week called upon to notice under the startling head of "Fatal Accidents;" and still more so, we think, when we reflect that in most cases such accidents are not only unnecessary—however sad they may be,—but are in fact easily preventible by the exercise of the simplest and most ordinary precaution. We have taken the trouble to string together, at random, a group of newspaper paragraphs just for the sake of more forcibly illustrating what we have, over and over again in these columns, pointed out as necessary to be done, either on the part of the State or of the individuals whose lives are subjected to such serious risks. The first example we shall take is the deplorable colliery explosion at Duckinfield last week, respecting which we quote a summarised account:—

"A colliery explosion, attended with deplorable loss of life, took place yesterday forenoon, in the Victoria pit, at Duckinfield, five or six miles east of Manchester. More than seventy men and boys were at work in the pit when the accident occurred, from some cause which the brief accounts we have received do not explain; but of this number, happily, thirty were got out of the pit alive. The remaining forty-three, however, did not come to the shaft; and the worst anticipations as to their fate were confirmed, when in the afternoon thirty-two bodies were found in the main level, having presumably been overtaken and suffocated by the foul air in their attempt to reach the foot of the shaft. Eleven of the workpeople are still missing, and it is believed that they will be found to have perished instantaneously by the force and on the spot of the explosion."—*Manchester Guardian.*

At this moment there are various circumstances assigned for the cause of the explosion. It is asserted that there was an accumulation of gas in an unused working, which escaped into the principal part of the mine. There is also reason to believe that there *was great laxity in the use of the Davy lamps*; for, according to the statement of some of the men, which, however, has been contradicted by others, boys were seen on the works with naked candles. A practice is also said to have prevailed in the mine which is very reprehensible. In all coal-pits there are men who are technically termed firemen, whose duty it is to go through every working and inspect the general condition of the pit; and if they find any evidence of fire-damp, or impure gas, to put up a board notifying the presence of gas and the danger of the working, and cautioning the men not to go near the place. It is the rule that these men should do nothing except discharge this duty, *upon the proper performance of which depends the safety of all in the pit.* If the fireman finds that the furnaces are low, and therefore the current of air is small, it is his duty to inform the furnace men of the fact; but it is said that in this mine the fireman was in the habit of replenishing the furnace, as well as attending to his own duty. Some disposition exists to attribute blame to Phillips, the deceased underlooker. Lastly, it is stated that *a sufficient inspection of the different workings was not made* on Thursday morning before the men were allowed to descend, which it was the duty of Phillips to make. The whole matter will, of course, be thoroughly sifted at the inquest, and in the course of the Government inspector's official investigation. But we venture to predict that the causes we have indicated will go to the root of the whole matter,—that is to say, negligence in the miners themselves, and negligence on the part of their employers or their overseers. Of course, we all know that the principle of cupidity or selfishness which some political economists confound with the instincts of progress, is generally sufficient to cause a collier who works by the piece to neglect his safety-lamp (which, like all precautionary measures, operates as an impediment). In other words, he will risk his life to earn a shilling or two extra. But unfortunately it is not his own life alone which is put in the balance! What is true of the men in this instance is also no less true on many occasions of their employers; and this Manchester catastrophe is a conspicuous illustration of the result.

Our next coal-pit accident is of another description, and cannot be properly attributed to either of the foregoing causes:—

"DUMBARTON.—SERIOUS COAL-PIT ACCIDENT.—An accident, which it is feared will prove fatal in the case of one man, took place in No. 2 Pit, Gartshore, on Tuesday. Two miners, named James Carr and John O'Donnell, both young men, were employed at what is termed 'holing,' when a large body of the facing gave way, bringing down with it an immense stone, which fell upon O'Donnell, and struck Carr's feet. Assistance was promptly rendered, but there is little hope of O'Donnell recovering from the severe injuries he has sustained. Carr's foot was bruised and his leg splintered."—*North British Mail.*

Still, we suspect there is negligence here of another order. This "holing" process is simply the process of *undermining*; always dangerous on the surface, but how much more so in a coalpit? It ought never to be intrusted to ordinary miners, "both young men." This is precisely the nature of the accident which brought down the whole side of a Cornish mine, the other day, and overwhelmed five or six miners in a mountain of the *débris* of copper ore.

Next to the category of "accidents in mines," that of "accidents on railways" would appear to be about the most prolific. We shall not refer to the ordinary class of accidents, such as those on the Great Northern, the other day; these have long ago been proved by repeated reports to be due to one cause chiefly, and that is gross carelessness. But here is one of less frequent occurrence:—

"A TRAIN ON FIRE.—On Friday, a train took fire on the Midland Railway between Birmingham and Derby. It appears that the body of one of the carriages in the midday down train, either through being too heavily freighted, or in consequence of defective springs, sank down on the wheels, and the friction set the wood on fire. One of the passengers shouted out of the window, and his cries being heard by the passengers in the adjoining carriages, at length the attention of the guard was attracted. The train was brought to a stand near Tamworth, and the carriage, in which a considerable hole had been burned, was detached from it. Some luggage belonging to a lady was burning, but the damage done was immaterial."—*Birmingham Post.*

Now, who freighted this carriage too heavily?—an occurrence, we suspect, that is much too common, particularly in luggage-vans. Or, if the springs were defective, why had not the ordinary inspector detected this? Supposing "one passenger" had not discovered the fire, or had not been possessed of strong lungs, where would the catastrophe have ended? Most certainly not with the burning of a lady's luggage. But, had there been some communication, however slight, between the passengers and the guard, such an event would be simply impossible. In addition to the possible attack of robbers and murderers in our railway-carriages, it now turns out that we are also liable to be roasted alive. Suppose we try the experiment of heat on a small scale, and make a railway director go through the ordeal of fire!

The only quarry accident we happen to have at hand is a very mild one, comparatively speaking; but it is another of the numerous melancholy examples we have of fatal blasting operations, which are pretty uniformly due to one cause,—recklessness in the quarrymen. It is, indeed, astonishing to see how they will trifle with the highly-dangerous instruments they are in the habit of using:—

"ACCIDENT AT CRAIGMILLAR QUARRY.—Yesterday, a very serious accident occurred at Craigmillar Quarry, by which a man named Barney Higgins was very severely hurt. While Higgins was engaged in a blasting operation, the powder exploded, and he was thrown violently to the ground. Besides being very much burned by the powder, he was severely bruised by the fragments of stone, his face and arms being mutilated, and his left thigh broken. He was taken to the Royal Infirmary, and his wounds dressed."—*Scotsman.*

It is highly proper to point out that the blasting "fusees" are sometimes so ill-manufactured that they refuse to explode. The workmen then venture close up to the seat of explosion in order to ascertain the cause, when, at that very moment, perhaps, the blast takes place, almost always to the destruction of life and limb. Very ordinary precautions, however, would suffice to prevent this class of fatal accidents; one ought to be that the blasting ingredients should be kept in a very dry place. How often is this simple precaution neglected at our quarries!

We shall now enter, just for a single moment, the region of our manufactures. This is, to be sure, well-trodden ground. But the graves are not the less frequently dug on that account. Our first example here we shall take from Glasgow:—

"SHOCKING ACCIDENT AT GLASGOW.—On Tuesday, while a man named John Neill, warper, residing in Gardner-street, was adjusting a machine belt in the Garscube Weaving Factory, his right arm got entangled in the machinery, and he was whirled round with such violence that the arm was torn away from his body. The unfortunate man was removed to the Infirmary, the medical men who attended him being of opinion that, in addition to the loss of his arm, he had been severely bruised internally."—*Glasgow Herald.*

This simple act, adjusting machinery belts, *while the machinery is in motion*, is unquestionably one of the most persistent causes of accidental death. Why should it be allowed? Had the above shaft been thrown out of gear for a few minutes, the adjustment could have been effected with absolute safety, and poor "John Neill, warper," would not then have had to incur the risk of losing his life, and, as it is, to lament the loss of his arm!

A second and still more shocking illustration of the accidents in manufactories we shall take from Sheffield, premising that Sheffield and its surrounding district is the "black country" of fatal accidents, along with other less positive causes of the high rate of its mortality bills:—

"FRIGHTFUL ACCIDENT IN A FILE MANUFACTORY.—On Friday se'nnight a frightful accident occurred at the file manufactory of Messrs. Blake, Brothers, Sheffield, by the breaking of a large grindstone. A young man, named John M'Donald, twenty-two years of age, was working at the stone, which had been in use about a week, and previously carefully tested, when, owing to the velocity with which it revolved—about 300 times per minute—it split into three pieces. The deceased was struck and flung through the roof of the grinding shed, and falling into the yard was picked up dead, his head being shattered to pieces."

Now, we venture to assert that there is not on our list a more common yet more easily preventible cause of fatal accidents than the splitting of these Sheffield grindstones! The mechanical law of it is so simple and easily understood, that we wonder no Government inspector has yet made a point of it. These ponderous stones are usually fixed upon a square shaft by means of timber wedges. There are no metal socket or

skeleton iron wheels bolted on each side, to distribute the *inertia* of the revolving mass. The whole pressure is concentrated on the keyhole; the consequence is, when the rate of velocity becomes greater than the power of cohesion of the loose friable sandstone, that the stone splits, exactly on the same principle that a block of any other kind of stone is split by wedges, and with the same unerring precision. Why should it not be made imperative, therefore, on the proprietors of such manufactories to take all reasonable precaution to *bind* their grindstones and to fit them with cast-iron keyholes? It is really too bad in this age of progress and mechanical invention that such flagrant outrages on our common humanity should be allowed to exist. These Sheffield grindstones already do quite sufficient damage to the lungs of the poor steel-grinders without splitting up and shattering their heads to pieces!

The last paragraph we shall quote under this head is really horrible to think of:—

"Last week two boys, aged respectively fourteen and ten years, fell into a pan of boiling salt at Winsford, and were scalded to death."

Why should such a possibility as this exist? It would be a comparatively easy and at the same time a cheap precaution to cover those salt-pans with a lid of stout wicker-work, which would not interfere with the process of evaporation, and would certainly put such an accident as this without the boundaries of probability. The same principle might apply to brewers' vats, and other capacious vessels, where the innumerable processes of boiling liquids are carried on.

Hitherto we have spoken of cases where the State may, and does, interfere with advantage to the saving of human life. But we cannot leave the subject without a single allusion to accidents of another order, in which the entire responsibility must necessarily reside with the individual. The first may belong to the category of sporting accidents, and its locality lies on the sea coast of the Scottish highlands:—

"DREADFUL DEATH.—On Tuesday, a boy named Grant, son of Mr. Joseph Grant, Ousdale, near the Ord, fell over the rocks at Ousdale while gathering seafowls' eggs, and, falling a distance of more than 300 ft. was dashed to pieces. The poor fellow was only about twelve years of age."—*Northern Ensign.*

The second belongs to the numerous and increasing class of volunteer accidents; but this one we think is of peculiarly painful character.

"FATAL ACCIDENT TO A VOLUNTEER.—A lamentable accident, resulting fatally, occurred to a young Scotch gentleman, named George Stewart, on Wednesday afternoon, at Winchester. Deceased, who was being educated at Winchester College, was a member of the cadet corps of the Volunteer Rifles, raised and maintained by that learned and venerable institution. Some of the college volunteers were at target-practice at the rifle-butts on Teg Down on Wednesday, and towards the close of the firing a young gentleman named Sewell (also a member of the corps) took a loaded rifle from the ground, and not having a cap upon the nipple, presumed that it was unloaded. Sewell placed a cap upon the rifle, pointed the weapon at another person's hand for the purpose of 'sighting' it, it is presumed, or in some juvenile frolic, pulled the trigger, and in an instant the fatal bullet had sped through the fingers of the upraised hand and into the breast of poor Stewart, who immediately exclaimed that he was wounded. He was promptly conveyed from the ground and medical assistance procured, but all efforts were unavailing, and he expired in a few hours. The father of the deceased was formerly member for Cambridge."—*Morning Post.*

Our last illustration, we apprehend is due to crinoline, or to that cognate category of light muslin which every year lays low some of our fairest women, and carries grief and gloomy sorrow into the bosom of some of our dearest friends.

"MELANCHOLY ACCIDENT.—An accident, which unhappily terminated fatally, and which has thrown a gloom over a large circle of friends, occurred at the house of the Very Rev. Dean Ramsay, 23, Ainslie-place, on Wednesday evening. Miss Lucy Cochrane, niece of the Venerable Dean by his lady's side, while sitting with him in his dressing-room, discovered that her clothes were on fire. Miss Cochrane rushed to the lobby staircase, in the hope, it is supposed, of getting assistance. One of the servants, attracted by her screams, caught the young lady at the foot of the stair, and, with great presence of mind, threw a piece of carpeting over her. Admiral Ramsay was likewise immediately at Miss Cochrane's side, and assisted in extinguishing the flames. Professor Henderson was at once sent for, and he called in Professor Spence, who continued with the suffering lady all night; but she was so much scorched, and her nervous system had received such a severe shock, that she expired yesterday forenoon. As there was no fire in the room in which Miss Cochrane first discovered that her dress was burning, and as she had been a short time in the room before making the discovery, the fire must have been smouldering in her dress for some time. Miss Cochrane was about twenty-two years of age, was the daughter of Rupert John Cochrane, Esq., New York, and was on a visit to Dean Ramsay when the melancholy accident happened."—*Scotsman.*

Now, in the first place, who is to blame for the death of a fine boy—too brave, perhaps—who scrambles over a cliff 300 ft. high? We need not answer the question any further than to say that it is not himself. Secondly, will no practical training teach even volunteers never to trust their rifle without the test of the ramrod? Finally, when will the women of England and France cease to array themselves in garments which may be likened unto grave-clothes? Or, at least, why not construct them of fire-proof materials? Surely sixpenny-worth of the tungstate of soda is not a very expensive ingredient to mix with the starch! If we might venture to plough alongside of Mr. Ruskin, we should tell them that they are like the coal-miners in their selfishness, only they risk their lives to adorn—alas! is it adornment?—their persons. They should remember, too, that like these underground workers, they do not perish alone; and that more lives than theirs may depend on the foolish risks which a lovely and accomplished lady will constantly run. And so ends our present chapter of accidents.

PICTURES BOUGHT FOR THE ART-UNION OF LONDON.

THE following works have been already selected by the prizeholders:—

From the Royal Academy.—Drawing Timber in Picardy, R. Beavis, 250*l.*; Happy Idleness, Mrs. M. Robbinson, 100*l.*; Eventide, E. N. Downard, 75*l.*; Louis XI. and Marie de Commines, E. Kennedy, 73*l.* 10*s.*; Returning from Market, W. Fyfe, 63*l.*; The Doomed Tree, R. Redgrave, R.A., 57*l.* 15*s.*; The Invalid's Friend, S. G. Pollard, 52*l.* 10*s.*; On the Conway, North Wales, J. Uwins, 50*l.*; The Tomb of Grace Darling, C. W. Nicholls, 50*l.*; Out of the Lifeboat, A. Farmer, 50*l.*; Cavaliers and Roundheads, A. Cooper, R.A., 36*l.* 15*s.*; A First Lesson, C. Rossiter, 36*l.* 15*s.*; The Prisoner of War, J. A. Fitzgerald, 35*l.*; Rest—study for a larger picture—F. W. Hulme, 30*l.*; View in Nottinghamshire, J. Thors, 25*l.*; Rough Pastures, W. S. Rose, 10*l.*

From the British Institution.—Luzern, from the Lake, G. C. Stanfield, 100*l.*; Whitby Harbour, E. J. Niemann, 75*l.*; Frozen Out, G. D. Leslie, 63*l.*; A Rough Road over the Heath, G. Cole, 63*l.*; Fruit, Miss E. H. Stannard, 50*l.*; The Tangled Thread, M. Claxton, 50*l.*; In the Lledr Valley, J. Godet, 40*l.*; Making the Bouquet, J. C. Thorn, 35*l.*; Shorthorns, A. Corbould, 30*l.*; View of the Pool of London, F. Moltino, 25*l.*; Uncle Charles's Favourites, G. Hepper, 25*l.*; Croquet in the Time of Charles II.; J. Barker, 25*l.*; Highland Stags, R. Cleminson, 20*l.*; Mumbles Lighthouse, H. K. Taylor, 15*l.*; Waiting for the Tide, A. Webb, 20*l.*

From the Society of British Artists.—Resting at Plough, J. Tennant, 150*l.*; Dutch Vessel entering Shields Harbour, E. Hayes, 100*l.*; Scene on the little Neath, J. C. Ward, 105*l.*; Gipsy Girls, W. Shayer, 85*l.*; A Carp Pond at Ockham, E. J. Cobbett, 84*l.*; Near Bettws-y-Coed, J. Syer, 75*l.*; Blackberry-gathering, E. J. Cobbett, 75*l.*; View in Richmond Park, J. Tennant, 70*l.*; Three Bluebottles, C. Stuart, 50*l.*; On the Teign, Chagford, W. Williams, 60*l.*; Near Weald, Essex, J. E. Meadows, 50*l.*; A Welsh Spring, E. J. Cobbett, 45*l.*; A Vessel ashore on Whitley Rocks, E. Hayes, 45*l.*; Ullswater from Patterdale, J. T. Walton, 40*l.*; The Harbour and Pier of Watchett, H. K. Taylor, 40*l.*; The Fern-gatherer, S. B. Godbold, 40*l.*; Coast Scene near Eastbourne, J. Tennant, 40*l.*; The Calf-shed, J. Henzell, 40*l.*; Gleaners, W. Shayer, 35*l.*; The Present, J. A. Fitzgerald, 35*l.*; On the Fal, Cornwall, W. Pitt, 30*l.*; The Mumbles Light, H. K. Taylor, 30*l.*; Dunstanborough Castle, H. K. Taylor, 30*l.*; A Summer's Afternoon, Isle of Man, J. T. Peele, 30*l.*; The Weald of Kent, W. S. Rose, 25*l.*; Whistling through the Wood, W. Bromley, 25*l.*; Farm-yard at Carlton, J. F. Herring, 25*l.*; A Breton Interior, A. Provis, 25*l.*; Haymaking, near Bolton Abbey, C. Earle, 22*l.*; A Mountain Stream, N. Wales, A. Barland, 21*l.*; Near Vevey, Switzerland, S. R. Percy, 20*l.*; A Lane in Summer Time, C. L. Coppard, 20*l.*; Near Walton-on-the-Naze, J. E. Meadows, 20*l.*; Stepping-stones on the Lledr, J. J. Curnock, 20*l.*; On the Thames near Henley, C. Pearson, 15*l.*; Enerdale Lake, T. C. Cracknell, 15*l.*; Amongst the Mountains, J. Carlisle, 15*l.*; "Will he buy?" W. Pilsbury, 10*l.* 10*s.*; The Mouth of the Thames, C. Danby, 10*l.* 10*s.*; Great at Cards, C. P. Slocombe, 10*l.*; Old Toll-house, Setzel, on the Rhine, A. H. Vickers, 10*l.*

From the Royal Scottish Academy.—In Kirkdale Glen, J. Faed, 30*l.*; Southwick Water, Dumfries-shire, Miss F. Stoddart, 12*l.* 12*s.*

From the Water Colour Society.—Lago d'Iseo, C. Smith, 52*l.* 10*s.*; Cornfield at Streatham, C. Smith, 52*l.* 10*s.*; In the Pass of Llanberis, D. Cox, jun., 50*l.*; Ro, near Conway, D. Cox, jun., 42*l.*; Ophelia, Mrs. H. Criddle, 36*l.* 15*s.*; Canale della Posta, Venice, W. Callow, 31*l.* 10*s.*; The Dacres Monument, Hurstmonceaux, J. Nash, 15*l.* 15*s.*; Capri, Bay of Naples, P. J. Naftel, 15*l.* 15*s.*

From the Institute of Painters in Water Colour.—Deborah sitting in Judgment, H. Warren, 150*l.*; On the Cornice, Gulf of Genoa, C. Vacher, 52*l.* 10*s.*; Looking across the Gulf of Suez, C. Vacher, 50*l.*; The River Tees, near Rokeby, J. W. Whymper, 30*l.*; At Studland, Dorset, J. H. Mole, 30*l.*; A Pleasant Look-out, C. H. Weigall, 25*l.*; The Tower Rock, Mewslade, J. G. Philp, 23*l.*; On the River Avon, Shipley Bridge, P. Mitchell, 26*l.* 5*s.*; The Outlet of Llyn Idwal, J. C. Reed, 20*l.*; The First Tarantella, A. Bouviers, 16*l.*; Changing the Pastures, H. Maplestone, 15*l.* 15*s.*; A Mountain Road, H. C. Pidgeon, 15*l.* 15*s.*; The Old Eschenheimer Tower and Gate, at Francfort, T. S. Boys, 15*l.*; A Grey Evening, Dockray, T. Sutcliffe, 11*l.*; Returning from the Harvest-field, H. Maplestone, 15*l.*; A Music Lesson, H. Warren, 10*l.* 10*s.*; Cullercoats, Northumberland, E. Hayes, 10*l.*

From the General Exhibition of Water Colour Drawings.—On the Thames at Hurley, F. Walton, 17*l.* 17*s.*; Fosse Rofin, on the Conway, T. Pritchard, 20*l.*

ARCHITECTURAL INSTRUCTION.*

IN a certain sense, architecture may be called the prose, as sculpture and painting are the poetry, of art. Its first principles are truthfulness, good sense, and perspicuity. In its higher walks, it grows eloquent and rhythmical; highly poetical in form and in purpose; aiming at the expression of sentiment more than of use, in a purely oratorical spirit: but, even here, intelligence and sound reason exert a controlling influence, and elsewhere they rule with absolute authority. Considerations of method, order, form, clearness, precision, and sobriety, are what make a good working style, both in writing and in building; and they demand the same qualities in the workman,—a quick and sensitive intelligence; an open, flexible, and cultivated mind. In both, the higher paths can be trodden by genius alone. That work can wait till genius comes. But there is in both a great and indispensable work, a work that cannot wait, a work which every-day necessities require to have done somehow; and it is of the highest advantage to the culture of every community, that in this work, both of literature and architecture, the best methods and ideas should everywhere prevail.

It is in establishing a high critical standard of performance in work of this sort, that, as I have said, educational institutions find their proper vocation. And it is as true here, when we are treating of style, as it was just now when we were speaking of the mere utilities, that, in the nature of things, an organized institution has, in this work, altogether the advantage of private enterprise. This thought has been recently developed, in its literary relations, with so much brilliancy and candour, by a critic whose name is identified, in this community at least, with the best criticism of the day, that it is already familiar as a household word. Almost every consideration which Mr. Arnold brings forward to illustrate the advantage to be derived to a national style from the influence of literary academies, applies almost in terms, and with a peculiar appositeness, to an architectural school. The academies of which he speaks are indeed institutions like the French Academy, a sort of literary hierarchy: the school we have in mind is a collection of neophytes. Both, however, tend alike to establish a high standard of performance, and may, so far, be spoken of in identical terms. I cannot deny myself the pleasure, in further illustration of this, of

* From "An Outline of a Course of Architectural Instruction," by Mr. William R. Ware, Professor of Architecture in the School of the Massachusetts Institute of Technology, read before the Society of Arts of that Institute, with a view to criticism before it be carried out. The first part of the "Outline" treats of the study of architecture as a useful art.

transcribing a few sentences from Mr. Arnold's essay:—

"An institution like the French Academy—an institution owing its existence to a national bent towards the things of the mind, towards culture, towards clearness, correctness, and propriety in thinking and speaking, and in its turn promoting this bent—sets standards in a number of directions, and creates, in all these directions, a force of educated opinion, checking and rebuking those who fall below those standards, or who set them at nought. . . . . It is not that there do not exist in England, as well as in France, a number of people perfectly well able to discern what is good in these matters from what is bad, and preferring what is good: but they are isolated; they form no powerful body of opinion; they are not strong enough to set a standard, up to which even the journeyman-work of literature must be brought, if it is to be vendible. Ignorance and charlatanism, in work of this kind, are always trying to pass off their wares as excellent, and to cry down criticism as the voice of an insignificant, over-fastidious minority: they easily persuade the multitude that this is so when the minority is scattered about as it is here; not so easily when it is banded together, as in the French Academy."

It remains, then, for us to consider how we had best take up this instruction in architecture proper, so as to inculcate sound and serviceable ideas in regard to architectural composition and design. There may be good building without it; but there can be no good architecture unless it is taught, and taught well. The question is twofold: what shall be taught, and how shall the instruction be given?

The first part of the question is already answered in general terms. The thing to be taught is the theory and practice of architectural design; and this is to be learned by studying its history, which everywhere illustrates its principles, and its principles, everywhere illustrated by its history. These principles have an independent existence and an abstract value; they are unchanged through all the changes of the past; and it is by their light, not by following the precedents of bygone ages, that we must hope to find, for the new and strange problems of the future, the simple, truthful, and characteristic solution they demand. Is there any scheme of instruction that can contemplate at once both aspects of the subject, and do justice to each? What course of study can satisfy the legitimate demand of the student for such a knowledge of the past, as shall fortify him with all the experience of the race, and, at the same time, leave him free from prejudice and pedantry, and the prestige of authority, to apply these principles simply and frankly to the work of the future and the present?

It is perhaps not impossible to meet, or rather get round, the difficulty; the difficulty of discriminating nicely between memory and invention, between pedantical learning and wholesome knowledge; the forbidden work of copying, and the legitimate and indispensable work of imitation; by keeping the two things as far apart as may be to start with, and not letting students enter the region where the difficulty and conflict are felt, until they are somewhat robust and mature through practice and experience. They might carry on together an *à priori* and an *à posteriori* course of study; alternating, so to speak, the subjective and the objective, the synthetic and analytical methods, nature with historic art, the future and the past. There might be one course of design founded on general principles,—the laws of harmony and proportion, the study of natural forms and their conventional adaptation to design, of the contrast and gradation of colour and form, and the expression and composition of abstract lines. This would be the æsthetic training, and the useful should accompany it; the class being set to design barns, sheds, cottages, country-houses, railroad stations, markets, &c., where they would be able to keep strictly to the requirements of convenience, and need have no temptation to indulge in the styles of the past; relying for effect only upon outlines, masses, light and shadow, or such other means of ornament and æsthetic expression as their other *à priori* studies might suggest. I think that by keeping to a small scale in the drawings, and not paying more attention to details than the state of progress warrants, something might thus be done to encourage a habit of simplicity and frankness in the treatment of architectural problems,—a habit of working up from the requirements of the problem to the *ensemble*, and thence to the detail, and not *vice versâ*, which, if it could obtain, would put new character and expression into our building, and could not fail to produce the only originality of style that is possible or desirable.

Such a course is, I know, open to the reproach of attempting to reconstruct civilization out of abstract ideas, and of trying to make students learn to design buildings out of the depths of their own consciousness. It is not impossible that serious objections are to be urged against it on theoretical or practical grounds, and it should of course, before being put in practice, be subjected to every test which criticism can bring to bear upon it.

These inventive studies I would alternate with other studies purely acquisitive; the deductive and synthetical method should give place to the inductive and analytical; the class now taking up a purely historical course, and discussing one by one, in their order of development, all the great styles of the past. They should be critically examined to see what they have to contribute in illustration of permanent and universal principles: but, at the same time, they should be studied as an expression of the age which produced them; and whatever assistance literature and scholarship and æsthetic and philosophical criticism can give in understanding the age, and discriminating the thought and feeling really at work in its architecture, should be afforded the student. At least, he should be encouraged to inquire not only what was done, but why, and the proper means of answering the question pointed out and set within his reach. Meanwhile, I would have all his work,—drawing, sketching, water-colours, modelling, carving, whatever might be in hand,—directed to the same channel; and if, for instance, Egypt were in turn, I would have nothing but Egyptian work; so that he might, if possible, breathe the very atmosphere of the civilization, and sympathize with its artistic manifestation. And, while sketches and memoranda were accumulating (and, throughout the whole, the constant employment of sketch-books and note-books would be a matter of course), I would have some good example of the style well drawn out, each student perhaps taking a different building; and, when the materials were pretty well in hand, I would have all make a design upon a subject assigned,—a restoration, or perhaps a simple original building, *not a modern building in the ancient style*, that is mere masquerading, but an ancient building, such as the ancients might themselves have built if they had chosen. And now the study of lines and mouldings, and masses and sky-lines, and geometrical design, and nature and the conventialization of nature, would all come into this historical chapter, as matter, not now of experiment, but of experience.

And it should be an object of especial care in these historical studies to distinguish the moral from the æsthetic qualities of ancient work, as is not always done in architectural criticism. There is a great deal of work, especially early work, which is so natural and truthful as to be an absolute expression of the civilization which produced it, and of the traditions and exigencies by which it was shaped, affording most interesting and instructive examples of the spirit in which the work of an unsophisticated age is done. But it may be all this, and still be quite destitute of artistic merit; it may illustrate none of the principles of composition or design. On the other hand, a great deal of work, especially late work, is deficient in these qualities, but full of delicate feeling, illustrating these principles in every line. The best work of the best ages has both kinds of excellence; but it is important for criticism to note, that truth may exist without beauty, and beauty without truth, and not to praise or condemn, in either respect, without raising a question as to the other.

The effect of these studies would of course be felt when the students returned to the other tack. They would not be able to look with unprejudiced eyes, and their reasoning would show a bias. All nature would now suggest Egyptian types; the most obvious treatment of natural forms and the most expressive turn of abstract lines would seem now to be the Egyptian. Very well. No harm is done, if they are adopted, because they seem to be natural, and are not intentionally borrowed; and against this borrowing, or stealing, or using the admirable remains of other ages, I think the subjects of this discipline would have two safeguards. In the first place, their habitual attitude would be hostile to it, the contrary principle of working altogether in the present in modern work being made a fundamental principle; and, in the second place, the natural and inevitable impulse to copy would find a legitimate channel in the prescribed task of restoration, and there would spend its force. After studying the remains of any style, one cannot but desire, in proportion as he is possessed of its spirit, to manipulate for himself the elements of which it is composed. If he has no good use to put them to, he will put them to a bad one; just as in the enthusiasm which followed Stewart and Revett's researches, all Christendom blossomed out with Doric banks, mints, and custom-houses; and we have to this day little pine Parthenons all over New England. Even now, our country carpenters, who retain the traditions of fifty years ago, will work a hyperbolic moulding upon the gutter of a barn, and carry it up the gable after the manner of the Athenians. But the exercises in restoration, or antique design, besides testing and fixing the student's knowledge of it, afford a legitimate outlet for this enthusiasm; and there only remains the spirit of the old time, giving life, not the dead form. The student may imitate,—he cannot help doing so,—but he will not copy.

It seems to me, that, by the time he gets out of his cottages and barns up to his markets and warehouses, every thing in the historical styles he has meanwhile been studying that is living and true, really germane to his own life, that is to say, really good for this nineteenth century, will have grown plastic in his hand; these old seeds will take root in his mind, if there is in it any richness of earth; and, the ancient stock entwining with the modern, the instinctive and natural tendencies of his fancy will rather be strengthened than stifled; so that his public buildings, when he comes to them, may reasonably show a mind at once full and free, and a method learned without being pedantic, eclectic without patchwork, simple and original without meagreness or caprice.

To say that such a result supposes, on the part of the pupil, talents of no common order, is true: indeed, only the man of genius could carry such a system to its final success. But this is only saying that the future problem of architecture is one which it requires the highest order of mental power to solve, which nobody would deny. What I would claim for such a system of instruction is, not only that the best minds might be subjected to it without injury,—a thing that can be said of but few of the methods of instruction now in vogue in any department of learning,—and that their best and most sensitive capacities would be by it fostered and generously developed; but that it would afford a wholesome and manly school for the development of any mind, of whatever kind and degree of power, warming into activity every germ of originality, and giving to every variety of talent a fair field for its exercise. That it would require a high order of ability to administer such a scheme so as to make the most of it, is also true; but a good system is one which, while it admits of the employment of the rarest ability in carrying it out, and indeed contemplates taking advantage of the best talent that may offer, yet does not demand for its satisfactory working much more than common intelligence and fidelity. I suppose this is as true in education as it is in government.

The remaining question—how all this instruction shall be given—depends for its answer upon the appliances the Institute can bring to bear upon it, and upon the condition of the profession in this community. A great deal of teaching would have to be given within the walls of the school, either by the regular corps of instructors, or by persons invited, from time to time, to give special courses on special subjects. History and antiquities admit, and indeed require, that whatever special learning there is in the community shall be availed of. Certain topics would require to be treated by experts, and the Institute would have to call in, from time to time, the aid of the best men the community affords to speak with authority and inspiration upon them. But very many of these topics, even those most difficult to discuss, are susceptible of perfectly satisfactory treatment, by means of what I may call a merely literary method. The geometrical theory of proportions, for example, is a subject upon which a great deal has been said by able men, and which constantly comes up for discussion without any conclusion being reached. It is too important to be passed over in silence, while not one man in ten thousand could be expected to have anything to say on the subject worth hearing. But any intelligent person, by collecting and collating what has been said upon it, discovering the points of agreement and of contradiction among his authors, would be able at the conclusion of his studies to form a just opinion on the general question, and to convey to our classes a greater amount of useful information upon it than ever was imparted; and the same may be said of many other topics. Lito-

rature is full of fragmentary discussions of great value, but they are as much out of use as if they had never been printed. It is in the power of the School, by the use of this merely literary procedure, not only to compensate itself for the absence of men of original genius, in those walks where men of genius are not readily to be found, but to do a great and much-needed service, by bringing into use these hidden treasures of thought and criticism.

The School would, of course, prescribe the work to be done, month by month; give out the problems to be solved, or programmes to be fulfilled; fix the times and conditions of examinations, and appoint the examiners. The principle that instructors should not sit in judgment upon the work of their own pupils should be strictly adhered to. It would probably be found perfectly practicable to obtain competent juries among amateurs and architects not in any way connected with the school. The great stimulus to be derived from the exhibition of the competitive drawings, and the publication of the names of the successful men, should not, of course, be foregone. Whether it is best for the pupils to do their work in the school, under the supervision and instruction of the professors, or whether they had best put themselves under the instruction of the different architects in the town, and come to the school only for lectures and examination, and to receive the programmes of the work they are to do, is a question of administration which has been variously answered in the schools of art abroad, and may here be left for future decision. The latter method is that of the École des Beaux Arts; and many of the architects in Paris have *ateliers* expressly devoted to their pupils, who pursue, under their direction, the studies prescribed by the school, or qualify themselves for admission into it. A student in the *atelier* of M. André, thus describes to me the details of this system:—

"Once a month we assemble in the *loges* of the school, and there find programmes which are to be 'rendered' in a month, six weeks, or two months, according to their difficulty. At the end of the day, we leave in the school an *esquisse*, or sketch of our idea of the way in which the requirements should be met, giving plan, section, and elevation in the simplest forms possible, merely indicating the *motif*. Indeed, it is quite an art to know how to indicate an *esquisse* in such a manner as to fulfil the requirements of the programme, and yet leave the most ground for changes in studying it out. You leave your original sketch in the hands of an officer of the school, and carry home with you a copy or tracing. When the *projet* is handed in, the *esquisses* are compared with the *rendus*, and those who have changed to much are put *hors de concours*. The other *projets* are judged and receive mentions, half-mentions, and, in the first class, medals of different degrees. In the second class they only give medals to *projets* of construction of superior merit. The *esquisse* carried off is shown to the *patron*, who directs your studies upon it, indicates the changes, and tells you, from day to day, his opinion of what you are doing.

"Half-way between the *esquisses* and the *rendus* come the *esquisses-esquisses*, so called because they are all done in one day, completely rendered. You are allowed twelve hours to do them in; and they must be completed, coloured, and washed in ink, by nine o'clock. They are capital exercises, and I would give one once a fortnight if I had pupils. The programmes, of course, must be short, and the scale demanded be rather small. The system of the school is *concours*. *Concours* for architecture, *concours* for construction, perspective, mathematics, descriptive geometry. You pass from the second class to the first by means of *concours*; and, in fact, emulation is the watchword. . . . All the work, except the *esquisses*, is done in the *atelier*. There are courses of lectures at the school; but the real work is done at the *atelier*."

This example shows how the whole body of architects in the city may be made to co-operate in the work of the Institute, without embarrassing it by any official connexion.

The methods pursued in the Kensington schools in London are, I believe, entirely different; the pupils receiving their instruction from the professors in the school, and doing all their work within its walls. The changes made in administration of the École des Beaux Arts by the decree of Nov. 13, 1863, contemplate an approach to the English system, so far at least as to establish a certain number of *ateliers* within the school. I do not know all the reasons for the proposed change, nor do I know whether this provision of the decree has been carried out in practice.

I have not been able to learn anything, but its name, of the new École Centrale de l'Architecture.

Of the administration of the English schools I have found it difficult to learn anything in detail, either in regard to that at Kensington, or those established under the patronage of the Royal Institute of British Architects and the Architectural Association. I have seen, however, a programme proposed by the Institute for test examinations, to be voluntarily undertaken by draughtsmen and architects who may desire to establish their claim to public confidence. The range of studies is comformable to the course sketched above; and it is gratifying to find that the Institute recognises the importance of giving to draughtsmen, as well as to architects, a superior culture.

SCHOOLS OF ART.

The Cambridge School.—The excursion of this school will be made this year to Wimpole. The Earl and Countess of Hardwicke have kindly offered all facilities for the gratification of the excursionists. The usual sketching prizes will be given; first prize, 1*l.* 7s.; second prize, 10s. 6d.

Dorchester.—An effort is now being made to establish a school of art in Dorchester. The Rev. B. L. Watson has been appointed provisional honorary secretary, and authorised to write to the borough members and others to ascertain what amount of pecuniary support may in the outset be relied upon. Should some such sum as 100*l.* be subscribed, in a short time, the local *Express* says, a ladies' class in mornings, a school class in afternoons, and an artisans' class in evenings, two or three days each week, will be established.

The Penzance School.—The interior of the school has been decorated by the pupils and teachers, and the casts and models renovated. The gas-lighting has also been improved, and the floor repaired. Numerous prizes have been got by the students, but the result of the competition for national medals is not yet stated.

SANITARY MATTERS.

Reading.—Mr. Woodman, the borough surveyor, has published in a pamphlet the result of his inquiries, in the shape of a report to the Local Board of Health, as to the best method of disposing of the town sewage. He states that he has visited Croydon, Norwood, Worthing, Edinburgh, Carlisle, and Worksop. The following paragraph summarises the conclusions at which Mr. Woodman has arrived:—"In my judgment, the practical result to be derived from this inquiry is, that the sewage of Reading can be utilized without pollution of rivers, with perfect freedom from injurious or unpleasant results, and at a trifling cost, and therefore should remove any prejudice which may have existed towards the drainage of the town. The value of the sewage would in this, as in other towns, materially reduce the annual rate entailed by so great a boon."

Cheltenham.—In accordance with a resolution passed by the Local Improvement Commissioners a committee appointed "To personally inspect and inquire into the sewerage system at present in operation at Stroud, Croydon, and elsewhere, and report the result of such inspection and inquiry to the Board at a future meeting," have visited Stroud and Croydon, and also the Cheltenham works; and after expressing their approval and appreciation of the great care and forethought shown by Mr. Humphris (their surveyor) in the carrying out the works hitherto during a period when knowledge of the disposal of the sewerage of large towns was very imperfect; the report thus concludes:—

"There can be little doubt *now*, that *when irrigation can be applied*, it is the best mode of dealing with this much-vexed question. As the result of their inspection and a full consideration of the subject, your committee are of opinion that the retention of the sewerage of the town in the hands of the Board, and the consequent necessity of their dealing with individual landowners, probably, many in number, is most undesirable: they therefore recommend that advertisements be placed in the papers, offering to responsible parties to dispose of the sewerage of the town, including the use of the tanks, &c.; but one condition must be embodied, which is, that to whomsoever it is let, he should give a guarantee with approved security, to hold your Board harmless from all actions at law from the pollution of the brooks; and, as a further protection, that he undertake not to pass any sewage water into the brooks (when practicable) till it had first passed over the land. In the meantime, your committee consider it to be most desirable that your Board should give a further trial of the deodorising powder, so successfully used at Stroud by Bird's Company, as there can be no doubt but that it is a most powerful deodorant, and under certain circumstances and conditions of the atmosphere, would probably be found to be most useful."

Wolverhampton.—At the recent meeting of the town council, several matters relating to the public health were brought under notice. The council seemed disposed to do all that was at once possible and necessary; but some of the members appeared to treat rather lightly nuisances that were manifestly injurious to the public health. A report is to be made concerning certain pestilential localities noticed in an article which recently appeared in the *Birmingham Daily Post*. A very extensive field is open for sanitary improvements here, as well as at Bilston, where an official inquiry is also to be made.

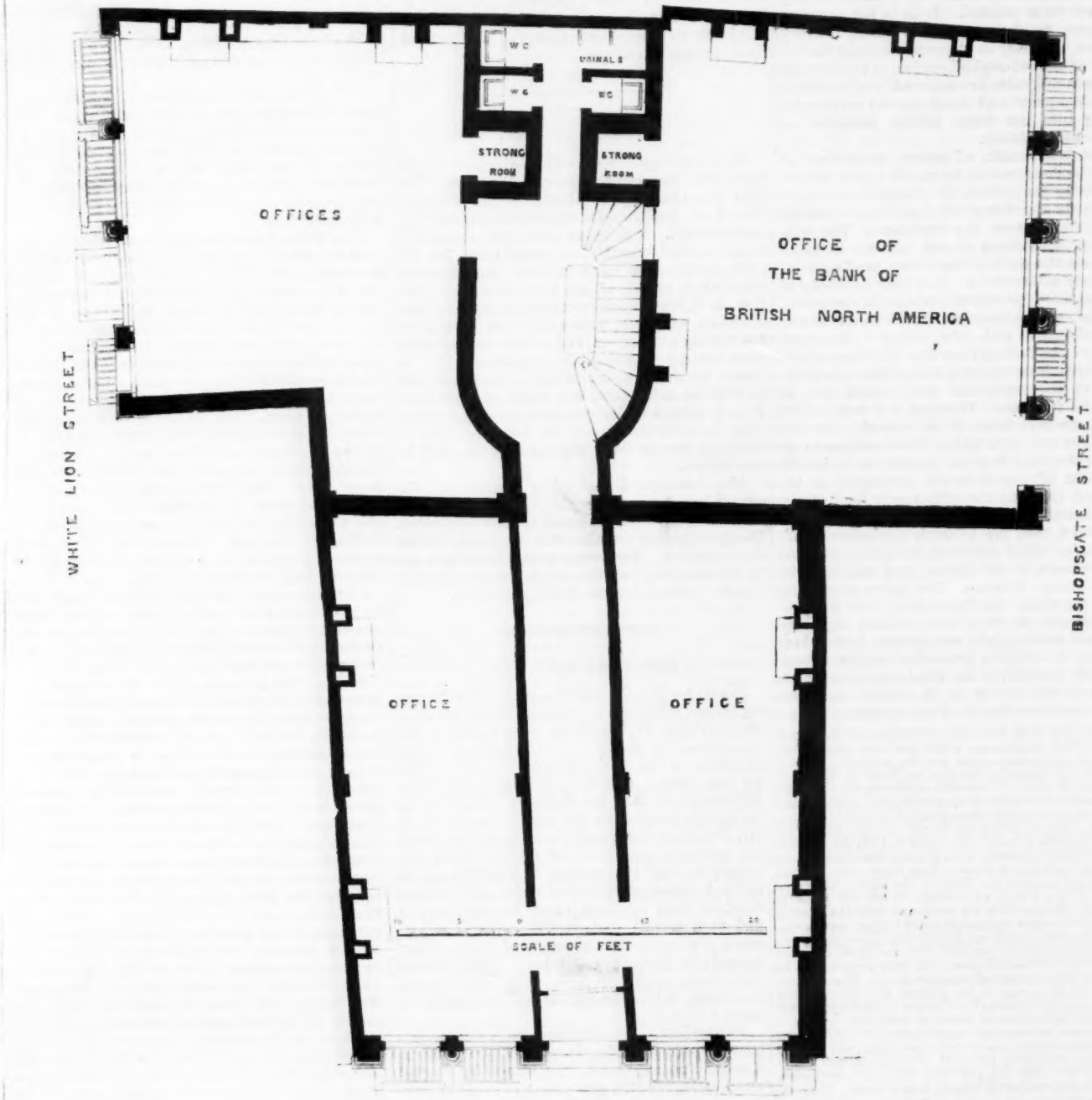
Willenhall.—The local board of health have appointed a committee of four members, to go round the town and inspect every place where a nuisance is said to exist. By this means the defects of the town may be discovered and remedied. In some quarters there is a disposition for being excessively tolerant as regards the keeping of pigs.

West Bromwich.—At a recent meeting of the local commissioners, five clergymen presented a memorial, complaining of the sanitary condition of the town, and particularly remonstrating against the course the Board had taken in refusing to adopt the "Smoke Consumption Act." The clergymen who signed this memorial attended at the meeting of commissioners, when they were asked to support their general statement by pointing out particular instances of neglect or error. This they proceeded to do, the cases mentioned being sufficiently numerous to occupy the Board some time in their correction. The interview being over, the inspector to the Board reported that, between May 30 and June 12, forty new cases of nuisance had arisen in the place, half of them being occasioned by inefficient drainage. He recommended that whitewash-brushes be supplied gratuitously to the poor inhabitants of the town.

Sheffield.—At the last monthly meeting of the town council, Alderman Saunders called attention to a resolution adopted in committee, on the motion of Alderman Webster, "That the borough surveyor be instructed to report upon the practicability and probable cost of a temporary system of deodorising the sewage of the borough, until the question of a main outfall sewer shall be finally decided." It was necessary, he said, that something should be done in this matter, as, to turn the whole of the sewage into the river below Attercliffe would undoubtedly create a greater nuisance at Rotherham than was caused at present. Alderman Beckett said he was very glad attention had been called to this matter, as from what Mr. Baxter said in London, the other day, it was clear application would be made on behalf of the Doncaster people, for an injunction to restrain them from turning the sewage into the river, if the plan sanctioned by the council at any previous meeting were carried out, of carrying the sewage by an outfall drain below Attercliffe, and then turning it into the river. Mr. Baxter had succeeded in applications for similar injunctions against several other towns. Mr. Hutchinson strongly objected to the sewage of the town being thrown into the river. He had supported the scheme for an outfall drain, he said, on the understanding that it was to be kept out of the river.

North Shields.—The Admiralty having refused to grant the request of some of the Corporations on the Tyne for a floating hospital, the Tynemouth Town Council, at their last meeting, resolved to erect a temporary hospital for the reception of sailors coming into the port who might be afflicted with cholera. Mr. Thomas Robson, the borough surveyor, was instructed to prepare the necessary plans, and the building is now approaching completion in the hands of Mr. Taylor, builder. The site was obtained from the agents of the Duke of Northumberland, at a merely nominal rent. It is situated on the top of the cliff at the south-west corner of Percy-square, and while close to the quarantine station, is within easy access for the medical men of the town. The hospital is a wooden building of one story, with a slate roof. The walls are made double in order to secure an equality of temperature in the sick ward. There is provision made for ventilation, and hot-water apparatus and baths will be placed in the scullery, the hospital being generally provided with requirements for the comfort of patients. It is 45 ft. long by 22 feet broad, and 12 ft. high, and will contain one ward for six patients, and a dispensary and scullery. The cost of the building will amount to about 220*l.*, exclusive, &c., of the rent.

New York.—It has been decided by the Board of Health of New York, that in cases of typhoid fever, cholera, yellow fever, and other diseases which are or may become epidemic, the police may enter any dwelling in which a person lies sick with such contagious disease, and remove the sufferer to the nearest hospital. All classes of dwellings, rich as well as poor, are to be subjected to these official visits.



CORNHILL CHAMBERS, LONDON.—*Ground Plan.*

JASPER.

An immense quarry of Jasper has been opened near Saint-Gervais, in part of the Mont Blanc range of mountains, by a company, who have sent some remarkable specimens to Paris, some of which being of a beautifully pure red, without veins, somewhat resembling the marble known as the *Rosso antico*. The working of the Saint-Gervais jasper quarries may lead to the discovery of veins richer still, since the works have hitherto been very limited, as there seems to be a vast bed of jasper, and an almost unlimited supply. The quarry is 5 acres in extent, and the depth to which it can be worked is 22 yards; this will give about 1,040,000 tons of jasper available in that quarry alone. Formerly, jasper used in Continental edifices was imported from Siberia and Russia; but it is now rarely employed except for brooches and other jewelry, the variety most prized being of a green colour, with red spots, known by the name of *bloodstone*. It is also used for pedestals for bronzes, &c. The Saint-Gervais jaspers can be furnished of sufficient dimensions for the ornamentation of public buildings and first-class residences, as slabs, panels, pillars, &c., cut and polished. Among the several orders given to the company, we may cite that of M. Garnier, the able architect of the new opera-house in Paris, who has ordered twelve jasper columns and forty medallions, for the decoration of the state saloons.

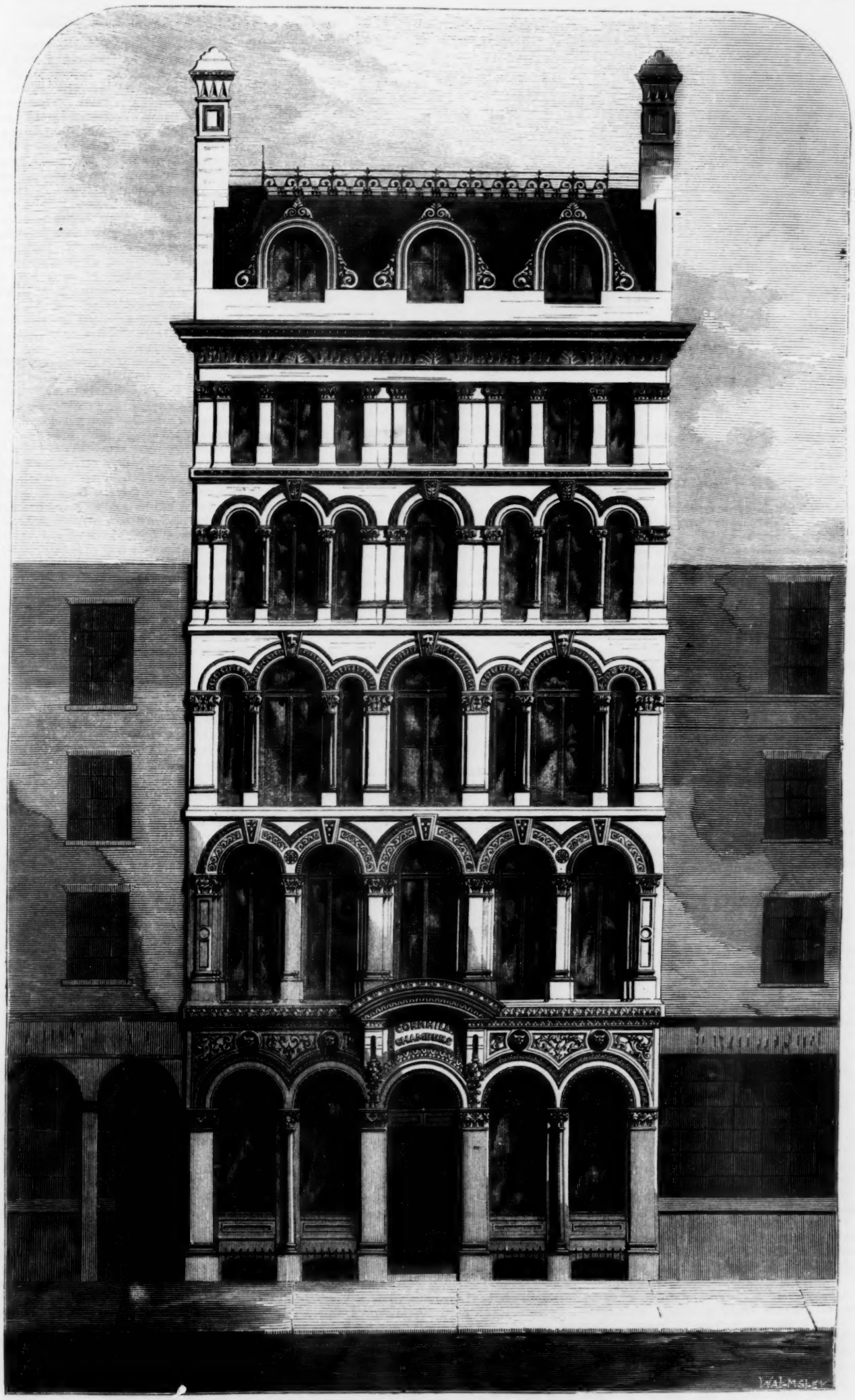
CORNHILL CHAMBERS, LONDON.

This building has been erected by a private company of shareholders, and is situated near the junction of Cornhill with Bishopsgate-street. It occupies the site of four old houses, with a superficial area of about 4,000 ft., and has frontages to Cornhill, Bishopsgate-street, and White Lion-court. It was originally intended to obtain the house at the corner of these streets, in addition to the present block, so as to continue the elevation entirely round into Bishopsgate-street, whereby the effect of the whole would have been materially improved; but the company were unable to come to terms with one of the leaseholders.

The building is divided into three blocks of offices fronting to the several public ways above mentioned, with a central staircase, as shown on the plan. In the basement are extensive cellars, suitable for wine merchants or similar businesses. The ground and first-floor are subdivided as little as possible, but have additional fireplaces for the convenience of tenants who may require to divide the space by screens or otherwise. The upper stories are arranged in smaller rooms as suites of offices, with doors of communication between. The top story has dwelling-rooms for the housekeeper and other accommodation.

The two principal fronts are faced with Tisbury stone, which has been comparatively little used in London, but is said to stand well the London atmosphere, and is cheaper, more easily worked, and of a warmer tint than Portland. Polished Aberdeen granite is used for the pilasters and shafts.

The works have been executed from the designs and under the superintendence of Mr. Edmund Woodthorpe, architect. The contractors were Messrs. Browne & Robinson, who have carried out the works satisfactorily. The amount of the original contract is 14,090*l.*, and the total cost 14,417*l.*



CORNHILL CHAMBERS, LONDON.——MR. EDMUND WOODTHORPE, ARCHITECT.

CONCRETE FOR SEA WORKS.

A PAPER has been read by M. Poirel before the French Academy on this important subject. M. Poirel is the author of a work* which, he states, has become a sort of text-book for engineers; and having had much experience, he considers himself entitled to speak with some degree of confidence. His plan of making mortar for the formation of concrete blocks is to take Roman pozzuolana, which has been sifted through metallic sieves, and combine it with a rich hydrate of lime containing two and half times its weight of water. One part by bulk of this hydrate is mixed either with two parts of pozzuolana, or with one part of pozzuolana and one of sea-sand, according to circumstances. When the concrete is to be submerged at once, the first plan is to be followed; but if it is to be dried before being used, the second method is to be employed. He exhibited to the Academy two pieces of concrete removed from blocks, which had been under water from 1835 to 1842. They were sufficiently hard to admit of being worked into prisms with sharp edges, the mortar taking the same polish as the stones which it enclosed. M. Poirel made use of concrete blocks of this composition at Leghorn and Algiers, the pozzuolana being obtained from the ground near the church of St. Paul, on the banks of the Tiber. At Algiers the lime was very rich, whilst at Leghorn it was slightly hydraulic. It is the practice to use Roman pozzuolana in Italy, Spain, and the Austrian ports of the Adriatic, for making concrete blocks, and for sea works in general. In the Levant, Greece, and Turkey, pozzuolana is also used, but it is obtained from the island of Santorino, which is just now the scene of extraordinary volcanic activity. He believes that none of the Roman cements are capable of resisting the destructive action of the salts contained in sea water, and he has no doubt but that all the English harbour works executed in Portland cement are doomed to more or less speedy destruction. For the last fifteen or twenty years, the use of Roman pozzuolana has been abandoned in France, and the concrete employed for marine works has been made with lime from Theil, a village in the department of Eure, fifteen miles from Louviers. It was used exclusively at Algiers, Toulon, Marseilles, and the harbour of Saida. The future will show whether these blocks will resist the action of sea water as well as those of which Roman pozzuolana is an ingredient. M. Poirel regards this as the only material capable of forming a perfect concrete for marine works. Another cause for anxiety is that whereas, when the use of pozzuolana was first abandoned, builders were careful to obtain the limestone from Theil, and burn it under their own inspection, so as to avoid all chance of bad burning, and even of fraud, it is now the practice to receive it from a contractor without taking proper precautions to ascertain that the quality is really what it professes to be. "By abandoning pozzuolana, engineers have voluntarily deprived themselves of the advantages which it possesses of communicating resisting properties to mortar, which increase according as the lime with which it is mixed is more hydraulic. This property has become of much greater importance since the labours of M. Vicat have proved the existence, in so many localities, of limes possessing a greater or lesser degree of hydraulicity." Economical considerations have doubtless caused this radical change; but M. Poirel says that this is quite a secondary question, owing to the small proportion of pozzuolana required in the manufacture of concrete blocks.

With reference to the new harbour works at Algiers, we may mention that the late Mr. Robert Stephenson stated, in 1857, that "the breakwater was not water-tight, and it was evident that considerable disintegration had taken place, as large cavities existed in the work. When the sea was agitated it was scarcely possible to walk on the mole on account of the jets of water which were driven through the apertures, with great velocity, to a considerable distance. The local engineers anticipated that these cavities would eventually be closed by the accretions of shells, by which several had been already stopped; but this presumed that the disintegration of the blocks would not also progress. Possibly this disintegration might have arisen, as had been suggested, from the use of artificial, instead of natural pozzuolana.

These remarks were made during the discussion of a paper read by the late Mr. George Rennie "On the Employment of Rubble *Béton*, or Concrete, in Works of Engineering and Architecture," which contains, our readers may remember, some valuable information on the subject.

* "Mémoire sur les Travaux à la Mer, comprenant l'Historique des Ouvrages executés au Port d'Alger, et l'Exposé complet et détaillé d'un Système de Fondation à la Mer au Moyen de Blocs de Béton." Paris, 1841.

KINGSTON TOWN-HALL COMPETITION—IRELAND.

IN the matter of the Kingston Town-hall competition, after many months' deliberation during which the competing architects were called upon to appear before and undergo cross-examination by the committee, a recommendation has been arrived at which the committee may be able to carry out if they succeed in raising nearly three times the sum mentioned in their conditions; but that they will do so is so doubtful, that the position of the successful man can be considered little else than uncomfortable, if not aggravating. It is this: he has prepared a design that may be called superb in conception, and in the execution of the drawings his idea of the separation of the departments is good; exceedingly convenient also is the provision of possibilities for future extension, or, more properly, completion. In this view his plan approaches excellence; but then is it justice to other competitors, that, knowing,—for know he must, if his motto "Experientia docet," stand for anything,—that his design comprehends what it is not possible should be carried out within the means of the Commissioners, he should run the risk of rendering futile the entire competition?—for this is generally the issue of such a practice. There may not be, among the other designs, one so beautiful, but there are those—three, at least, of the twelve submitted,—which provide the required accommodation, and are capable of being constructed within the amount at the disposal of the committee; and if a little latitude be allowed, possibly by an addition of a sum from 500*l.* to 1,000*l.* beyond the amount stated, six of the designs are fairly open for selection. These are, perhaps, the designs signed, "Neptune," alternative; Mr. Wm. Fogerty; Mr. E. H. Carson; Mr. Charles Geoghegan; "Be just and fear not;" and "Alpha E." Three of these would seem calculated for execution within the amount stipulated. And truly it is scarcely fair to permit any extension.

The designs recommended by the Town Commissioners have yet to go before the Commissioners of Public Works for examination and approval, and there is no doubt that the question of cost and suitability will be fairly weighed: the result will be carefully watched by many non-competitors.

THE TRADES MOVEMENT.

Ipswich.—The painters who have been on strike have returned to work on the old terms, 20s. a week. What they demanded was a rise of 8d. a day, 6d. extra for work done out of town, and to leave off on Saturdays at 4 p.m.

Swansea.—The journeymen painters, plumbers, and ship-carpenters still remain on strike, refusing to make the least concession from their first demands. Several of the master painters have offered to meet the men with a considerable advance of wages, and to allow the half-holiday on Saturday, but their offers were rejected. The seamen of the port have since struck for more wages.

Stockport.—The stonemasons, who had agreed to a settlement of disputes by arbitration, nevertheless struck work in the face of this agreement, and still stand out. This strike has stopped every building in course of construction in the town, and even the union men employed by the corporation have been taken out. The public works committee have given notice to the surveyor that he must not take them on again on any conditions whatever.

Leeds.—Plasterers' labourers have struck for an advance of wages from 20s. to 22s. per week. The masters have offered 21s., but this has been refused.

Sheffield. — The dispute in the Sheffield file trade has at length come to an end. The men go in upon the old terms, but the employers have promised to consider the claims of any particular section of the operatives whom they may deem entitled to an advance. The struggle has lasted sixteen weeks, and the pecuniary loss has been immense. The unions have incurred a vast amount of debt, and it is calculated that there has been a loss of 70,000*l.* or 80,000*l.* in wages alone. The masters have suffered heavily, and several of the weaker firms have got into the *Gazette*. It should be added that machines have already been erected, and, with their aid, the masters hope to be able to retain the pre-eminence that Sheffield has hitherto enjoyed in the file trade.

Carlisle.—The Association of the Master Joiners and Cabinetmakers thus explain their position and that of their men. The wages up to the first of April last, were 24s. per week of fifty-eight hours. On that date, in accordance with notice sent to the masters, the men went out on strike for 27s. per week, which the masters see no necessity for giving in the present state of the trade. The masters proposed arbitration, and have received this reply:—

"White Lion Inn, June 14th, 1866.

Sir,—In answer to your communication of this morning we wish you to fully understand that we will not entertain the idea of arbitration at all, and think you ought to have made the proposal long since. After waiting eleven weeks, we will adhere to our original proposal, and take nothing less than our first demand.

We are, yours respectfully,
THE JOINERS OF CARLISLE."

The Masters' Association, at their committee meeting, unanimously resolved to postpone any further meetings of the Association for a month, to give the men time to reconsider their determination.

Belfast.—The greater number of the carpenters in the employment of builders in this town are now on strike. Hitherto the carpenters have had three-quarters of an hour for breakfast and a like interval for dinner, and they recently gave notice that they wished to negotiate for an hour for each meal. Some of the employers have given the hour. A number, however, have not acceded to the demand, and a strike has been the result. In the mills the carpenters cannot reasonably expect the hour, it seems, but it is understood that an equivalent in wages to the extra quarter of an hour will be paid.

Miscellaneous.—Mr. B. Cochrane recently gave notice in the Commons, that on the 29th of June, he would call attention to the dangerous increase in the organisation of trades unions. ——In a recent police case, in which one Joseph Hill, a ticket-of-leave man, was found guilty of stealing a leg of mutton, which he stole while employed by his master in painting the prosecutor's shop, it transpired in court that masters in the building trade were not allowed to inquire into the character of the men they employed; on which the magistrate, Mr. Payne, said he thought that was a most extraordinary state of affairs.

LIQUID FUEL.

WE have heard much of late about petroleum as a steam fuel, but up to the present time the results of experiments in this direction do not seem to have been very definite or very encouraging. For some months past Mr. C. J. Richardson, who has taken out a patent for his apparatus, has been carrying on experiments at Woolwich Dockyard. The principle of his furnace is probably sufficiently well known to those of our readers who are interested in the subject. Trial has lately been made in Russia by Captain Schepakovski, of the Military School at St. Petersburg, of a furnace for burning fluid hydrocarbons, which appears to possess some points of interest. If "petroleum is ever to be used commercially as steam fuel, it is probable that some such arrangement as that proposed by Captain Schepakovski will be employed for burning it. The principle of his apparatus is very simple, and is one with which we are just now very familiar owing to the recent introduction of the 'vaporizer.' This little instrument consists of two tubes placed at right angles to each other with the extremities in contact. One of these tubes is placed in the liquid to be 'vaporized,' and air is forced through the other, which causes an upward current through the first tube. The liquid ascends, and on arriving at the extremity of the tube is dispersed in finely-divided spray. It is upon this principle that the improved furnace is based. The boat in which the boiler was fixed was 24 ft. long and 5 ft. wide, and was fitted with a steam-engine of two-horse power, by the aid of which a speed of six knots per hour was

obtained, the quantity of turpentine consumed being three pounds per horse-power per hour. The boiler was heated by four jets, the turpentine being contained in a reservoir at the bows. It is stated that the heat obtained by a lamp constructed on this principle is enormous — sufficient to melt steel. This was actually shown some weeks ago by the inventor in a lecture, in the course of which a fragment of copper weighing three-quarters of an ounce was melted by a lamp burning between two and five pounds of turpentine per hour. The flame was about 2 ft. in length, and was of a yellowish white colour. The noise was like that produced by steam escaping from a boiler. The application of the lamp to the superficial charring of wood for preservative purposes was also exhibited."

Oil of turpentine is composed exclusively of carbon and hydrogen in the proportion of five atoms of the former to four of the latter, and a pound of this substance would contain thirty parts by weight of carbon to four parts of hydrogen. When it is burnt under the ordinary conditions, only a small quantity of this carbon is employed in the formation of heat; another part is consumed in the production of light, and the remainder escapes unburnt as smoke. In the apparatus which we have noticed, the turpentine being in a highly divided state, is placed under the most favourable conditions for complete combustion, the supply of oxygen being sufficient to consume the whole of the carbon, very little of which is wasted in the formation of either light or smoke.

We have purposely omitted all considerations of cost, and it may fairly be doubted whether the substitution of petroleum, or any other fluid hydro-carbon, for coal, will be attended with any great economy. M. Schepakovski's experiments appear to have been made exclusively with turpentine, which is, of course, not so expensive an article in Russia as in this country.

THE QUEEN ELIZABETH PROCESSION IN THE KENSINGTON NATIONAL PORTRAIT GALLERY.

I HAVE studied, carefully, a letter in the *Times* of Tuesday last, touching—learnedly, but not, to my thinking, conclusively—on one of the most important and instructive pictures now on loan at the Kensington Exhibition of British Portraits. I refer to No. 256, "Queen Elizabeth carried in State to Hunsdon House, 18th September, 1571," attributed to "Mark Gerrard" (I copy the catalogue), and lent by Mr. G. Digby Wingfield Digby, of Sherborne Castle (Sir Walter Raleigh's and Carr Earl of Somerset's Sherborne Castle) in Dorsetshire; where, years ago, I had the pleasure of seeing it, and subsequently had some influence in inducing the late Earl of Digby (its then owner) to send it on loan to the Manchester Art Treasures Exhibition. It is a highly historical picture, rich in portraiture, manners, and costume. The picture was shown as No. 64 of the British Portrait Gallery of the Manchester Art-Treasures Exhibition of 1857, where it was described as, "Queen Elizabeth in a Sedan, in a Procession to Hunsdon House, Hertford. Engraved by Vertue. Walpole by Wornum, p. 166."

When the picture was at Manchester, Mr. Caldesi published a good photograph from it, with the house of Colnaghi & Scott, in Pall Mall East.

The letter in the *Times* is dated from the "National Portrait Gallery, Westminster," and carries the signature of Mr. George Scharf, F.S.A., the secretary to the trustees of that gallery. Mr. Scharf disputes the received "interpretation" of this "curious historical picture," as he truly calls it, and with the assistance of that pains-taking inquirer, Mr. J. Gough Nichols, proceeds to give his own version of what the picture in reality represents. Mr. Scharf's letter merits preservation:—

"It may interest many of your readers to learn the true interpretation of the curious historical picture, No. 256, of the National Portrait Exhibition, at South Kensington, representing Queen Elizabeth borne in a palanquin or litter on the shoulders of six gentlemen, and surrounded by the leading personages of her Court.

Unfortunately, the explanations hitherto given, both of the locality and of the different persons represented, are almost entirely without foundation. I therefore solicit space in your widely circulated columns to put some check upon a daily increasing spread of error, and to point out as briefly as possible the events which the artist really intended to commemorate.

Instead of representing—as Vertue, in defiance of an earlier and well-grounded tradition, chose to conjecture—a Royal visit to Hunsdon House, Hertfordshire, in 1571, it relates to a marriage that took place at Blackfriars some twenty-nine years later.

This locality of the wedding, at the houses of Lord Cobham and Lady Russell, nearly on the site where Printing-house-square now stands, may tend further to justify the selection I have made in requesting publicity at your hands.

It is somewhat singular that the event represented, and not by any means an obscure one, has escaped the notice of all who have hitherto undertaken to describe the picture. It was incidentally mentioned to me by Mr. John G. Nichols, F.S.A., and I hope that that gentleman's extensive knowledge and active researches may still be brought to bear upon the topography and illustration of the curious buildings that compose the background.

The following passage—not to quote the 'Sidney Papers' and 'Nichols's Progresses,'—from Miss Aikin's 'Memoirs of the Court of Queen Elizabeth,' will conclusively establish the subject of the picture:—

'Her Majesty (June 16, 1600), repaired to Lady Russell's house in Blackfriars, to grace the nuptials of her daughter, a maid of honour, with Lord Herbert, son of the Earl of Worcester; on which occasion it may be mentioned that she was conveyed from the waterside in a lectica, or half-litter, borne by six knights.'

The bride met the Queen at the water-side. This change of date, from 1571 to 1600, has the effect of removing from the scene six out of the seven noblemen specially named by Vertue. They all died before the opening of the seventeenth century; in their stead, we find an interesting group of several marked characters, although of comparatively minor historical importance.

The bald-headed nobleman, in lieu of Dudley, Earl of Leicester, is Edward, fourth Earl of Worcester, father of the bridegroom; and the bridegroom himself, Lord Herbert, afterwards first Marquis of Worcester (see No. 640 of Portrait Exhibition), is dressed in white, and carries the right-hand end of the pole on his shoulder, extending his left arm in a peculiar manner. Immediately behind him follows the bride, Mistress Anne Russell, also in white, between two married ladies wearing ruffs that completely cover their necks, and in black and gray dresses. The lady seen between the bride and bridegroom appears to be Lucy Harrington, Countess of Bedford, wife of the bride's cousin, Edward, the third earl. The lady supporting the bride, on her left, is probably the Marchioness of Winchester.

Other ladies would be the Lady Blanche Somerset, married to Lord Arundel of Wardour; Mistress Mary Fytton, Mistress Anne Carey, and Mrs. Bess Russell, a sister, who died in less than a month afterwards.

The only nobleman now to be identified with Vertue's nomenclature is the Earl of Nottingham, Lord High Admiral.

George Clifford, Earl of Cumberland, who led the bride from church, is the figure in orange satin between the Admiral and George, second Lord Hunsdon, carrying the Chamberlain's wand. The ladies wear jewelled badges on their left sleeves, but no particular device characterizes them; all the men wear white shoes. Notwithstanding the brilliant display of dress and profusion of ornamental jewelry, it is remarkable that, with the exception of one ring upon the Queen's left hand, no rings are worn, and no gloves are to be seen except a solitary pair, held ostentatious by the Earl of Worcester."

Now, with every respect for Mr. Scharf and Mr. Gough Nichols, I am in no way inclined to desert George Vertue, Edward Harley Earl of Oxford, and Horace Walpole Earl of Orford, for their new interpretation, and against the twin description of those gentlemen I beg to oppose the following passage in Walpole's "Life of Mr. George Vertue:" *

"In 1737 the Earl of Leicester carried him [Vertue] to Penshurst; and the end of the same year Lord Oxford took him again to . . . . and to Lord Digby's at Coleshill, to view the curious picture of Queen Elizabeth's procession, since removed by the late Lord to Sherborne Castle, in Dorsetshire. . . . . The next year he went into Hertfordshire, to verify his ideas about Hunsdon, the subject, as he thought, of Queen Elizabeth's progress. The old Lord Digby, who, from tradition, believed it the Queen's procession to St. Paul's after the destruction of the Armada, was displeased with Vertue's new hypothesis."

What "the old Lord Digby" would have thought of Messrs. Scharf's & Nichols's "new hypothesis," we may readily imagine; and with what reading and reference and humour Horace Walpole would have exposed it, all the readers of that enchanting writer can form an immediate and safe conjecture.

Messrs. Scharf and Nichols remove the date from 1571 to 1600, when the most eminent persons in the picture (the queen excepted) were dead. Lord Hunsdon was buried in Westminster Abbey (where his huge monument is still to be seen) in 1596; Lord Burleigh was buried at Stamford in 1598; Lord Sussex at Boreham, in Essex, in 1583; and Dudley Lord Leicester at Warwick in 1588. I may mention here that the Rev. James Granger (no mean authority) seems never to have entertained a doubt about the scenery or locality of this picture. He fixes the date "cir. A. 1580."†

Let me here mention that the most valuable portrait we have of Queen Elizabeth is at Hatfield, in Hertfordshire, the seat of the Marquis of Salisbury, and is engraved in Lodge. It is assigned to Zucchero. Her dress is allegorical. Her robe of golden tissue is worked with eyes and ears,—as all-seeing and all-hearing. On her arm is a serpent,—the type of wisdom,—set and embroidered with pearls and rubies. On her ruff is a gauntlet, by way of challenge, or as indicative of one from whom honours flow. A A rainbow in her hand carries the motto,—

"Non sine sole Iris."

I mention this picture for the purpose of calling attention to "The Devise to Entertayne" Queen Elizabeth at Harefield, in Middlesex, then (July 1602) the seat of Lord Keeper Egerton (afterwards) Lord Chancellor Ellesmere. The "devise" opens with "The humble peticõn of a giltlesse saint wherewth y° gowne of rainebowes was presented to hir Ma^ty." This device was first printed (by me) in 1845, in the second volume of the Shakspeare Society's Papers.* The guiltless saint is Saint Swithin, to whom the 15th of July is dedicated. "The gown of rainbowes" was typical of fine weather. The water saint, in his speech to the Queen, alludes to "Iris" as "an unbidden gueste." The whole device was by Sir John Davys, the poet and lawyer, and is very characteristic.

On the following 24th March Queen Elizabeth was—no more.

PETER CUNNINGHAM.

* Walpole's Works, iv., 125; and Walpole's Anecdotes, by Wornum, p. 994.

† Granger, i., 181., second edition, 8vo., 1775.

* Shakspeare Society's Papers, vol. ii., p. 65.

NORTHERN ARCHITECTURAL ASSOCIATION.

ANNUAL EXCURSION.

THE council of this association having some months ago fixed upon Alnwick for this year's excursion meeting, the members and their friends proceeded thither on Tuesday, the 12th inst., from Newcastle, and had unusual facilities for inspecting the entire building afforded them. On entering the keep of the castle, the members were met by Mrs. Yardley, the housekeeper, and Mr. John Foreman, the clerk of works, and under their guidance the tour of the grand suite was leisurely made. They afterwards visited St. Paul's Church, and saw the magnificent stained-glass window, placed there under the auspices of the late Duke, in memory of his brother. At four p.m., the whole party dined at the Northumberland Arms; present, the President (Mr. John Green), in the chair; Mr. F. R. Wilson, in the vice-chair; Mr. Thomas Oliver, honorary secretary; Mr. Johnstone Hogg; Mr. J. Johnstone; Mr. Gibson Kyle; Mr. J. Howison; Mr. T. A. Moore; Mr. James Hogg; Mr. Clemence, South Shields; Mr. S. G. Brown; Mr. Ullathorne; Mr. Irwin; Mr. J. H. Moore; Mr. Ross, Darlington, members of the association. The visitors were Mr. John Foreman, of Alnwick Castle; Mr. Hugh Lee Pattinson; Mr. Mewburn; Mr. R. Dixon; Mr. Stokoe; Mr. Cook, and Signor Bulletti.

TOWER PIERS.

RESTORATION OF ST. DAVID'S CATHEDRAL.

SOME rather difficult engineering work has just been performed in St. David's Cathedral, in removing the lower part of the great tower, which was in danger of falling, and putting in new piers. The tottering condition of the tower, which needed prompt attention, induced the Bishop of St. David's and the leading inhabitants of South Wales to invite Mr. Scott to examine and report, in 1862, upon these old ruins. There is no town or railway within less than 18 miles, the ancient city of St. David's being nothing more than a village, with omnibus communication with civilized regions about once or twice a week.

Mr. Scott's report was to the effect that the present structure was commenced about the year 1180, by Bishop de Leia, at the exact time when the Romanesque or round-arched style was in a state of transition into the Pointed Gothic, and at the period when architecture was being freed from the barbarism of the Dark Ages. About this time, also, the Church of St. Cross, near Winchester, was built. From the fifteenth century to the present time the cathedral has been falling into a disgraceful state of decay; the old and new sides of the tower had begun to separate in the course of years; so he found a great crack in the masonry, caused by the sinking of the western side, which also crushed down portions of the nave, and threw most of

the pillars of the arches out of the perpendicular.

The *Engineer* gives the following particulars of the works:—Mr. Scott estimated the necessary expense of the restoration at 30,000*l*. The work of restoration was divided into four contracts; and, the most urgent being that for the preservation of the great tower, it was let out first, to Messrs. Wood & Sons, of Worcester. This contract amounts to 11,000*l*., which sum includes the construction of a drain all round the cathedral, to carry off the water already mentioned; taking out the two west piers of the tower, and replacing them with new on the ancient model; restoring the tower, repairing and restoring the choir stalls and seats; repairing the organ; and repairing thoroughly the eastern chancel.

The actual work of reparation was commenced about a year and a half ago, under the direction of Mr. J. B. Clear, the resident architect, who at once began the difficult work of repairing the tower, on the same plan as that adopted a few years since in the preservation of the tower of the Cathedral of Bayeux, in France. The tower of St. David's Cathedral is 124 ft. high, 40 ft. square externally, and weighs more than 4,000 tons. Mr. Clear began by fixing bracing inside and outside the tower, and bolting its walls together to make it as much in one piece as possible, after which he screwed the sides of the tower 3 in. closer to each other. The bracing, which consisted of massive ties of iron, of course took none of the weight of the tower. He next constructed some incompressible foundations for shoring of the most massive description, the supports containing, in all, 17,000 cubic feet of timber under the north and west arches, and against the two western piers. The whole weight of the tower rested for a considerable length of time principally upon the shoring upon oak needles passing through the spandrels of the arches, wrought-iron girders being placed across the angles. The needles were supported by fir logs erected nearly perpendicularly, each of the logs being composed of nine pieces of timber from 14 in. square, bolted and framed together. It was an anxious time when the crazy tower, the heavy patchwork of three bishops, was first allowed to rest on the timber supports, and it is said in St. David's that the resident architect was assisting in operations beneath it at the moment, and told his men that if the tower *did* come down he would be smashed first. While the tower rested on the main shoring, the two western piers were gradually rebuilt beneath it, in good cement work, and in small portions at a time, a movable system of shores being used to sustain the work in immediate contact with the parts operated upon. The north-west pier was commenced on the 12th of January last, and finished on the 12th of March, when the south-west pier was begun, and finished on the 19th of last month, so the great tower is now safe again for some centuries.

METROPOLITAN BOARD OF WORKS.

AT the usual weekly meeting of the members of this Board, last week, a long discussion took place, on a recommendation of the Building Committee, with reference to the new building now in course of erection, at Charing Cross, for the Sun Fire Office, it appearing that in November last this Board had given permission to extend the new building, 2 ft. 3 in. beyond the former site; but instead of adhering to this limitation, the builder had extended the frontage 3 in. more on the public way. The committee recommended that the Board should adhere to its original order, and that the building should be set back 3 in. from the present erection. It was urged that such an encroachment on the public footpath should not be allowed; that there was a mistake made in the first instance in allowing a projection of 2 ft. 3 in.; but that the taking of 3 in. more should not be permitted, and especially so as the land in this district was valued by the inch.

The recommendation of the committee was agreed to, and it was ordered that a prohibitory notice from proceeding should be served on the builder forthwith.

SANITARY MATTERS IN MARGATE.

WE see by the *Kentish Observer*, of June 14th, that the Council of the Borough of Margate have sanctioned the sewering of a portion of the low neighbourhoods of Love-lane, Puddle Dock, and King-street, into an existing town drain, originally intended for surface-water only, and discharging into the sea in close proximity to the jetty and beach, the once-favourite promenade and recreation-ground of thousands of visitors.

Our "*word of advice*" would therefore seem to have fallen upon deaf ears; and, if the ratepayers are so wilfully blind to their own interests as to permit the prosperity of Margate to be hazarded, and an evil name to be given to its hitherto well-deserved character for healthfulness, it is their own fault, and they must take the consequence. It seems almost incredible to state that this permission has been given under sanction of a mayor who is said to be an experienced medical man; for surely such, of all others, should know that town sewage discharged upon the sea-shore between high and low water mark exhales the most noxious gases, far more putrid and offensive by combination with sea-water than if mixing with fresh.

The property thus allowed to empty its house-drainage into the town drain is that which last year we had to point out as being frequently under water: it was bad enough then, flooded with surface and tidal waters only, but what will it be when these are mixed with the outpourings of sinks and soil-pipes?

The scheme, if carried out, will be a serious injury to the town. The outfall indicated is the very worst than can be found, being within a few yards of the jetty, and immediately under the Fort.

SIR,—Will you do me the favour to publish the figures sent herewith relating to the health of Margate during the warmer months of the year. This will prove a curious fact, and do an act of justice to the reputation of the town.

EDWARD MOTTLEY.

Mortality of Margate during the warmer months for the five years 1858-62, extracted from the registration, and being the years in which it was most frequented by visitors. It may be here generally stated that the annual mortality of Europe varies very materially during the twelve months; for example, May is generally an unhealthy month; June, on the contrary is distinguished by a low death-rate. The mortality of July is lower than that of May, but higher than June; while the mortality of August and of September shows a considerable increase in the numbers dying.

The following table will place the health of Margate during these months clearly before your readers, and it requires very little commentary or explanation:—

1858—1862.

Months.	Deaths.	To 10,000 living, five years' average.	
May	70	168	Residents.
June	41	99	
July	55	133	
August	74	177	
September	57	137	

The mortality of 17 per 1,000 being a normal condition of health. Singularly enough, the years most distinguished by the number of visitors are amongst the most healthy upon record.

ISLINGTON WORKHOUSE COMPETITION.

THE authors of the three selected designs, of which the mottoes were advertised last week, are No. 1, Mr. Burden, Oxford-street; 2, Mr. Ellis, Austin Friars; 3, Mr. Bressey, Wanstead.

THE LATE MR. WIERTZ, ARTIST.

A CORRESPONDENT, Mr. Haas, with reference to our recent notice of the late Mr. Wiertz, informs us that one of his best works, the Homeric contest, or, as the picture is called, "Les Grecs et les Troyens se disputant le Corps de Patrocle," is at present exhibited in the Crystal Palace, Sydenham. "This picture, of which he had disposed previously to his engagement with the Belgian Government, is the original of that which is at the Museum in Brussels, and has become, after various adventures, the property of a gentleman in Antwerp."

DWELLINGS FOR THE LABOURING CLASSES.

THE new Act to enable the Public Loan Commissioners to make advances towards the erection of dwellings for the Labouring Classes has just been printed. It recites that by the Labouring Classes' Lodginghouses Act, 1851, powers were vested in certain local authorities for the purpose of facilitating the erection of lodginghouses for the labouring classes, and declares it is desirable that further provision should be made for facilitating and encouraging the erection of dwellings for the labouring classes in populous places. The Act is to be incorporated with the Lodginghouses Act, and the Public Loan Commissioners may make loans to Councils, Boards, or Commissioners, authorized to carry out the Act recited, and to any local authority acting under the Nuisances Removal Act, 1855, to Railway, Dock, or Harbour Commissioners, associations established for the purpose of this Act or for trading or manufacturing purposes, or to a private individual having a fee simple for a term of not less than 50 years. The objects of the loan are set forth and the money to be advanced on interest agreed upon, the same not being less than 4 per cent., and 40 years given for repayment. Other Acts are incorporated with the present, and the powers given to companies are detailed. Mr. M'Cullagh Torrens brought up (on Tuesday) the report of the Select Committee on the Artisans and Labourers' Dwellings Bill. Friday was fixed for its discussion, but under present circumstances this will, of course, stand over. We hear that it has been much cut about in committee, but that enough remains to be useful.

SHAM SURVEYORS.

SIR,—Fraught as is the profession with difficulties, and comprehensive as is the mental training, as well as the practical instruction required to qualify a man for the profession of "Civil Engineer and Surveyor," is it not very annoying to the *really* qualified man, that with no education, no practical knowledge, and with very *little* theoretical knowledge, another may at any time start in opposition to him, and damage or take away his fair chance of employment simply by assuming that impudence that will allow him to put "Architect and Civil Engineer," or "Civil Engineer and Surveyor," on his window blind or brass door-plate?

I was lately a candidate for a borough surveyorship, where there were 10 applicants who asked for salaries at from 120*l*. to 200*l*. per annum: 120*l*. was the lowest salary asked, and 160*l*. the next, the others varying up to 200*l*. I asked 150*l*., and produced vouchers of my having been employed under Government and other public bodies for the last fifteen years, and having had large experience for six years as a borough surveyor, and having designed and executed extensive and successful drainage and water works, as well as having been assistant engineer for some years on two railways, and a Gold Medallist of the College of Engineers at Putney, where I studied three years ere commencing practice.

The next lowest tender to mine was that of the successful candidate, a self-styled "surveyor;" a *smart* man as the world goes, no doubt, but one whose sole qualification seemed to be that he called himself upon his door-plate, and advertised himself largely as "auctioneer and surveyor," and offered to perform the duties of this borough surveyorship 30*l*. per year less than any qualified man did. I venture to say, sir, he did not know a "dumpy" from a Y level, or a circumferenter from a theodolite, the difference of a "parting slip" from a "meeting bar," a "countess" from a "lady" or a "queen;" a sample of "blue lias" from one of Roman cement, or a "bull-nose" brick from a common "paver." Yet, sir, he applied for the surveyorship, and got it by seven votes against six. I am one of the aggrieved, and on behalf of others as well as of myself, I venture to state the facts and ask, Can no means be devised of our hedging ourselves around by some legal enactment such as that which protects surgeons and solicitors from the intrusion of invaders into their profession?

INSIGNIS.

CONSTRUCTION OF TAN PITS.

A CORRESPONDENT writes:—Can any of your numerous readers or correspondents inform me whether, in any of the extensive tanneries in Britain, or on the Continent, tan-pits have ever been constructed of bricks and cement; and what is, or would probably be, the effects of pits so constructed on the process of tanning?

HOUSE-PAINTERS' WAGES.

SIR,—Allow me to make a few remarks in reference to the meeting of the masters that took place last week to consider whether they should give the halfpenny above that which they already advanced; a report of which appeared in your last week's edition. The result of this meeting is evidently against the required demand. But it has done some good. The worthy chairman, Mr. Crace, very honestly says that there are two classes of workmen, one to pick in a panel at a Belgravia mansion, the other to wield the pound brush on the outside of some enterprising linen draper's establishment; two widely different branches of the same trade. No one will deny the superiority of the one over the other, consequently they should be remunerated accordingly. Mr. Crace says that he is in the habit of giving two prices; but men in the same firm, all under the denomination of painters, are apt to grow discontented at their more artistic companions: thus laying the groundwork of strikes.

Again, who is to draw the line between these two classes, as the masters themselves are very rarely ever seen by the men? Thus this most important duty would rest entirely upon the fraternity technically called coddies,* whose practical knowledge is often confined to

* Coddy, evidently derived from the word cod, meaning a big fish.

the stone colour of every-day life, men of quantity, *not* quality; consequently genius would stand but a poor chance with them.

The method which I should suggest to remedy these evils, is that there should be one standard rate of wages for painters, the superior or pencil-work to be paid as piece work by measurement, or according to the number of colours and the richness of the figure. And I think, by these means, both master and man will receive a fair day's work for a fair day's pay. Trusting to your well-known impartiality for inserting this in your valuable journal, I am, &c., G. COLLIER, Designer, &c.

ERECTION ON A FLAT.—BUILDING ACT.

THE DISTRICT SURVEYOR OF ST. MARYLEBONE *v.* COCK.

IN this case, before Mr. Knox, the magistrate at Marylebone police-court, defendant had erected a W.C. at the back of the house, No. 69, Oxford-street, rising above the flat roof over a show-room on the ground-floor. Two sides were enclosed with quartering covered with zinc. The stairs leading up were taken out of the show-room itself. The district surveyor considered that this erection was appurtenant to the house, and not an erection upon a roof, and that it must, therefore, be enclosed with brick walls carried up from below.

The defendant contended that it was an erection on the roof, of the nature of a dormer "or other erection" (sec. 19), and that it was only necessary to carry up the party wall in brick-work. The case was adjourned for an inspection of the premises, and on May 25th Mr. Knox attended at the premises, and determined that the enclosure was an external wall, and must be in conformity with the Act.

CHURCH-BUILDING NEWS.

Shortwood (*Gloucestershire*).—A new church or chapel of ease has been consecrated at Shortwood, a village 5 miles from Stroud, about a mile beyond Nailsworth, and an equal distance from Horsley. The edifice comprises nave and chancel, and is capable of seating 200 persons. The building is surrounded by a wall. It is roofed with rough stones, which are said to have covered in a workhouse that formerly stood on the site. The style is Early Decorated. At one end is a small bell-turret. There is a porch on the north side, and a vestry is separated by a curtain from the chancel. The nave is 51 ft. long and 22 ft. broad. The body of the church is lighted by five windows on the one side, and four on the other. These windows are divided into two lights, with a circular light above, which may be opened, and are filled with glass bordered in purple, blue, red, and yellow. There are three smaller windows at the sides of the chancel, and at each end of the church is a large window of three lights. The pointed roof is supported by stained rafters resting on carved freestone corbels. All the seats are open: they are of stained wood. The whole cost is 900*l*. The architect was Mr. Clissold, of Stroud; and the builder, Mr. Edmd. Clayfield, of Horsley.

Great Holland.—The parish church has been rebuilt and consecrated. It is of Early English Gothic, designed by Mr. Arthur W. Blomfield, of London, and built by Mr. Joseph Grimes, of Colchester. The walls are of rubble, faced with round flint, and Bath-stone dressings. The roof is of plain red tiles, surmounted by a crested ridge. There is an entrance-porch on the south, corresponding with the architecture of the church, with richly-moulded arch, open-timbered and tiled roof, and coped gable, surmounted by a foliated cross, the gift of Mr. Charles Hicks, one of the churchwardens. Among the principal features of the interior is a stone arcade of four arches (the columns having moulded caps and bases), dividing the nave from the north aisle. The chancel east window consists of three lancet lights, filled with stained glass, the gift of the rector; and there are single-lancet windows on the north and south sides of the chancel, which are also filled with stained glass. All the chancel windows have inside shafts of Devonshire marble, with moulded stone caps and bases. On the south side of the nave are three two-light windows, filled with stained glass. The north aisle is lighted with four similar windows, filled with tinted cathedral glass. The tower, which was formerly blocked up by a gallery, has been cleared and thrown open to the church, and the space inside the base fitted with sittings for the school-children. A portion of the north aisle is partitioned for a vestry. The floors of the nave, aisle, and tower are paved with red and blue Staffordshire tiles; and that of the chancel with Maw's encaustic tiles. The church is seated throughout with open benches, oak-stained and varnished. The roofs are open timbered, of fir, stained in imitation of oak. The reredos on the east wall of the chancel, with the creed and decalogue, and also the stained windows of the nave, are the work of Messrs. Heaton, Butler, & Bayne, of London. The churchyard has a new boundary wall, of stone rubble, with moulded brick coping, and a pair of framed deal gates, stained and varnished. The cost of the re-erection of the church amounts to about 2,000*l*., nearly the whole of which is borne by the rector, the Rev. R. Joynes.

Croydon. — St. Matthew's Church has been consecrated. The church stands on a small slip of land in the Addiscombe-road, and cost in round numbers 5,000*l*. Of that sum 4,750*l*. had been subscribed, leaving a deficiency of 250*l*. The building is of the early French style, decorated in the interior, and will seat 600 persons. With but few alterations the original plans have been carried out. The only important alteration noticed on entering the edifice is the ceiled and painted roof instead of an open one, with oak stained timbers. The chancel and chancel roof are decorated. The building will be lighted by jets of gas arranged round the capitals or shafts, about twelve on each shaft, and two rows along the chancel arcades. At present the interior of the church presents an unfinished appearance.

Burton.—The cemetery here has been consecrated. It occupies an area of twelve acres, and is situated on the high ground adjoining Scalpcliff Hill, the river Trent flowing in the valley beneath. The approach is from the Stapenhill-road, to which the cemetery has a frontage of 242 yards. The entrance is placed in the centre of this frontage, and forms a prominent feature, having a central carriage entrance with foot entrances on either side, arched and gabled. On the sides of the carriage entrance are buttresses, upon which stand emblematical figures, above life size, of Faith and Hope, surmounted by canopies, with pinnacles rising to a height of 36 ft. The gates are of wrought-iron. The boundary fence to the public road, right and left of the entrance, consists af a dwarf wall, with cast-iron railings, and piers at intervals; the other fences are of split oak. The registrar's house and office adjoin the entrance. The consecrated and unconsecrated chapels stand right and left upon a raised terrace. Each chapel comprises vestry, waiting-room, and other conveniences, and is fitted up with sittings of polished pitch pine and reading-desk of oak. The coffins have separate aisles provided for them, divided from the chapel by screens of stone and glass. These coffin aisles are subjected to a thorough current of air, while the chapels are kept warm and free from draught. The chapels and all the other buildings are in the Gothic style of thirteenth century, built of stone from the Whatstandwell, Coxbench, and Hollington quarries. The whole of the works have been executed under the direction of Messrs. Lucy & Littler, of Liverpool, architects. The general contractors were Messrs. Simpson & Lynam, of Nottingham; and the railing and gates were manufactured by Mr. Brawn, of Birmingham, from the architects' designs. Mr. Green, of Manchester, executed the carving; and Mr. Godwin, of Ashbourne, supplied the trees and shrubs.

Macclesfield.—The Church of England part of the new cemetery here has been consecrated. The chapels, Established, Nonconformist, and Roman Catholic, are separate and stand in different parts of the grounds. They are somewhat similar in structure; the Roman Catholic being rather smaller, but with a little more decoration. The style is Decorated. The chapels have been designed and carried out under the immediate superintendence of Mr. James Stephens, architect. The stonework has been wrought and built by the masons belonging to the Corporation, under the superintendence of the surveyor to the Board, Mr. Aspinwall. The carpenter and joiner's work has been done by Mr. Evans; the plumbing, glazing, and ironwork by Mr. Davies; the plastering and moulded internal decoration by Messrs. Kirkham & Son, painting and varnishing by Mr. Williams; and the slating by Mr. Brooks. The stone carving was done by Mr. T. R. Williams, of Manchester, sculptor. The grounds are being laid out by Mr. Middlebrook, the curator of the Public Park.

Kingston-on-Thames.—The chief stone of the new Christ Church for New Malden and Coombe, near Kingston, has been laid. Mr. Freshwater is the architect, and Mr. Cumber the builder.

March. — The chief stone of the cemetery chapels has been laid here. The new cemetery is situated on the east side of the Station-road, about 300 yards from the Railway Station. The land purchased for this purpose is between six and seven acres in extent, and, in accordance with designs prepared by Mr. G. W. Stephenson, the architect of the Local Board, it is intended to appropriate four acres for present use, reserving the remainder for future extension of the cemetery, if and when required. The buildings will consist of an entrance and lodge for the sexton, and two mortuary chapels, connected by a tower and a spire 80 ft. high. All the walls will be of wall-stone, from the Warmsmouth quarries, hammer dressed, and laid in random courses, and the other masonry will be of wrought Ancaster stone. The style of architecture is Pointed, of about the fourteenth century. The chapels will be approached by a gravel roadway, 170 ft. long and 15 ft. wide, ornamented on either side by evergreens and shrubs.

Salisbury.—The new church of Fonthill Gifford, near Salisbury, has been consecrated. The edifice, which is built at the sole cost of the Marquis of Westminster, is 100 ft. long from east to west, 60 ft. across the transepts, and 28 ft. across the nave. The church, which is built in the style of architecture which prevailed in France during the early part of the thirteenth century, has a nave, north and south transepts, chancel with apsidal end, and a vestry on the north side. The principal entrance is through a groined porch beneath a tower erected at the south-east angle of the chancel and south transept. From this tower rises a spire, at the angles of which are four pinnacles. The whole of the exterior is built of Tisbury stone, the greater part of which belonged to the old church, and which has been reworked and built as random ashlar, pointed with grey mortar. The whole of the interior is lined with Bath stone, and a string course of green stone, breast high, runs round the nave and transepts. The roof of the nave is of open work, the wood employed being red Memel pine. The roof is supported by six corbels on each side of the nave, carved in naturalesque foliage. The transepts are separated from the nave by two equilateral arches, resting on Devonshire marble columns, 16 in. in diameter, with freestone capitals and bases. The chancel arch is moulded and finished with carved crockets in alternate patterns. The arch is supported by Devonshire marble columns, with freestone annulets in the middle of the shafts, and with carved freestone capitals and bases. A receding arch is supported by two short columns of Irish green marble, resting on corbels. The chancel is groined with rock chalk, the moulded ribs, which are of freestone, springing from Purbeck marble columns. There are five Early English windows in the apse, and two cinquefoil windows on the north side of the chancel. At the west front are two Early English windows, divided by a buttress, over which is a circular window, composed of eight quatrefoils, running round a circle with eight cusps. The window is filled with stained glass, executed by Messrs. Lavers & Barraud. In the centre is a representation of Christ blessing Little Children. On each side of the nave are Early English windows of two lights, with a cinquefoil over. At the north-east angle of the tower is a circular turret, which is covered with a tile roof of conical form, terminating with an iron finial. The whole of the roofs are covered with tiles, and the chancel ridge is finished with an ornamental iron cresting. The belfry windows in the tower are of two lights, with quatrefoils, and the arches are supported by Derbyshire marble columns. The four cardinal sides of the spire have windows, with gablets over. The spire is over 100 ft. high, and is finished with ornamented ironwork and gilt copper vane. The seats in the nave and transepts are of varnished oak. The doors are also of oak, with Early English ironwork, executed by Mr. George Williams, of Shaftesbury. In the vestry, on the north wall, is a stone which was discovered in the old church. It has the following inscription:—

"18th May, 1748,
William Beckford, Esq.,
Founder."

The church is warmed throughout with Messrs. Haden's heating apparatus. Mr. T. H. Wyatt, the diocesan architect, furnished designs for the edifice; Mr. T. B. Miles, of Shaftesbury, was the contractor. Mr. A. Harrison superintended the works, and the carving was executed by Sansom.

Newland.—The old parish church is now swept away, and on the site of its little homely chancel has been erected a stone cross, to mark the spot. The cross, which is the production of Mr. Forsyth, is 23 ft. high, and is a conspicuous object to many parts of Malvern and the adjacent country. There are four steps to the base, and a slab of red Mansfield stone on one side of the base contains a Latin inscription, explanatory of the object of the cross. On each of the other three sides is a quatrefoil, inclosing a Maltese cross of black marble. The shaft is of a light grey Staffordshire stone, and between the limbs of the cross at the top of the shaft is the sacred monogram in a vesica, with the inscription, "In hoc vince."

STAINED GLASS.

All Saints', Emscote.—Two memorial windows have just been placed in this building. The one on the north side contains four large figures of St. Clement, St. Ignatius, St. Polycarp, and St. Hermes. In the tracery above are emblems of saints and angels, bearing inscriptions, with wreaths, &c. That on the south side has four figures of corresponding size, namely, the Virgin Mary, Anne the prophetess, Mary Magdalene, and Elizabeth. The tracery above is similar to that in the other window, and both windows were composed and executed by Mr. T. Dury, of Warwick.

Church of Holy Sepulchre, Northampton.—This church has recently had three stained-glass windows, manufactured by Messrs. Hardman, of Birmingham, put in the chancel, money for the purchase of them having been guaranteed by fifteen ladies of the congregation, who undertook to collect the amount. The subjects represented are in accordance with the character and designation of the church. Each window is divided into four compartments or panels. The four panels in the north window, reading from the bottom panel, on the north, to the panel above, and so forth, represent:—1. The hewing of the stone for the Sepulchre; 2. The entombment of Christ; 3. Setting the guard over the tomb; and 4. The sealing of the tomb. The centre, or east window, represents:—1. The angel rolling away the stone; 2. The Resurrection; 3. Mary weeping near the sepulchre; and 4. The two angels guarding the sepulchre. The south window represents:—1. The risen Saviour making himself known to Mary Magdalene; 2. The three Marys and the angel near the sepulchre; 3. St. Peter and St. John looking into the sepulchre; and 4. Christ making himself known to the disciples at Emmaus.

St. Stephen's, Bristol.—A west window has been executed for the Merchant Venturers, and put up in St. Stephen's Church, the hall of the society being situated in that parish. The work is by Messrs. A. & W. H. O'Connor, of London. The window is a large perpendicular one, of six main lights divided by a transom, and a tracery of an important series of openings. The subjects are six in number, each subject occupying two compartments: they are as follow—1. The Ordination of St. Stephen as deacon; 2. St. Stephen distributing alms; 3. St. Stephen preaching; 4. St. Stephen's defence before the council; 5. His martyrdom; 6. His burial. These subjects are enshrined in tabernacle ornament of jewelled effect, and above these, in the upper part of the main lights, and filling the entire tracery, is shown, on a crimson ruby ground, the heavenly vision of our Lord in glory, surrounded by the host of angels, bearing crowns of martyrdom and palms.

Holy Trinity Church, Prestolee, Lancashire.—The windows in the north transept of this church have just been filled with stained glass. The large window is in memory of the late Mrs. Crompton, who built and endowed the church; and the work has been executed by Messrs. Ballantine & Son, of Edinburgh, by whom the large east and west windows were formerly done. The large north window represents Christ preaching and blessing little children. In the central shape of the tracery are three angels with palms, and in the two side shapes are texts.

Guizely Church, near Leeds.—A twin-light window has been erected in this church in memory of Dr. George Gardener. The subjects illustrated are "Christ Healing the Sick," and the "Raising of Lazarus." The emblem of the Trinity is introduced into the central shape of tracery, and the canopies, bases, grounds, and borderings are deep in colour, and in unison with the architecture of the building. On a brass beneath the window is the inscription.

St. Cuthbert's Church, Blaydon-on-Tyne.—The great east window of this church has been recently filled with stained glass, which has been erected at the expense of the Rev. W. Brown, rector of Blaydon, as a memorial to several members of his family, and contains four large groups from the Life of Christ, surrounded by geometrical ornamenttation, interlaced with foliage, on azure and carmine backgrounds. Appropriate emblems and monograms enrich the tracery. The two windows south of the chancel have also been adorned with stained glass, of an ornamental character; likewise the triplet window in the west gable, which latter has been placed as a memorial to the late Mr. J. Mitford, who gave 100*l.* towards the completion of the church, and left a further sum for the benefit of the poor of the parish for ever. The whole are from the stained-glass works of Mr. H. M. Barnett, of Newcastle-on-Tyne.

Books Received.

History of Julius Cæsar. Vol. II. The Wars in Gaul. London: Cassell, Petter, & Galpin.

THAT the active ruler of such a country as France should find time, even with all possible aid, to write a work such as this, is only one of many extraordinary circumstances in the life of the Emperor Napoleon III. His previous experience as an author has no doubt facilitated his labours on the "Life of Cæsar," and has shown the nations how he can write, and how improbable it is that any one else deserves the credit of having written the "Life of Cæsar" in his name. That he himself has done it no one competent to speak either doubts or insinuates; and the fact is certainly an extraordinary one.

The present volume relates to the wars in Gaul, after the "Commentaries," and it ends with the crossing of the Rubicon.

The work needs no criticism from us: it has already been fully made known to readers of all orders by the press, a portion of which appears to be of opinion that the author meant perpetually to insinuate parallels between Cæsar's actions and his own or his renowned uncle's, Napoleon I.; while another portion can see no such intention. Either way, however, the work is a most able and instructive one.

In the particularly interesting address made by Earl Stanhope, as president of the Society of Antiquaries, at their last annual meeting, his lordship read the letter which the Emperor had written to him, on receiving intimation that the council, appreciating the high literary merit of the "Life of Cæsar," had elected the author of that Life one of their Royal Fellows. As our readers may like to see the letter (not hitherto made public), we give it textually:—

"Aux Tuileries, 30 Juin, 1865.

MILORD,—J'ai reçu à mon retour d'Alger le diplôme que la Société des Antiquaires de Londres m'a adressé en me conférant le titre de membre honoraire de cette savante réunion. Je suis très flatté que mes travaux historiques aient mérité l'attention d'un corps aussi distingué et m'aient valu un pareil honneur. Veuillez-vous rendre l'interprète de ma reconnaissance auprès de vos collègues et recevoir pour vous-même avec mes remercîments l'assurance de mes sentiments de haute estime.

NAPOLEON."

Penny Readings, in Prose and Verse. Selected and edited by J. E. CARPENTER. Library edition. London: Warne & Co. 1866.

BOUND together in three volumes, this selection, of which we spoke favourably as it appeared originally, makes a table-book of more than ordinary interest. As an advanced reading-book for the school-room, too, it may be warmly recommended. Mr. Carpenter has performed his task with much discrimination, prefacing each "piece" with a few judicious particulars of the author.

Practical General Continental Guide. By an Englishman Abroad. London: Simpkin, Marshall, & Co. 1866.

HERE, in a small flexible volume for pocket or knapsack, is given a large amount of direction in the most condensed form, for the advantage of travellers, concerning Belgium, Holland, the Rhine, parts of Germany, Switzerland, Venice, Italy, &c. We must award praise for the manner in which this is done. The practical plans, showing the relative positions of objects of interest, are very useful.

A Biographical and Critical Dictionary of Recent and Living Painters and Engravers. By HENRY OTTLEY. London: H. G. Bohn, York-street, Covent Garden. 1866.

THIS volume is a supplement to Bryan's excellent "Dictionary of Painters and Engravers," as edited by George Stanley fourteen years ago. Mr. Henry Ottley, with a practised pen and good knowledge of art-doings in modern times, claims, in respect of this book, little beyond the recognition due to industrious and judicious compilation. This, and something more, we are quite willing to award him. Depending, to a great extent, on supplied materials, there is a want of balance in the notices which may be rectified in the next edition. Meanwhile, the present will be found very useful.

VARIORUM.

"NATURE AND ART" is the title of a new monthly serial, of which No. 1 has been issued by Day & Son, intended to direct attention to that which is interesting in nature and admirable in art. Chromo-lithography and photo-lithography are employed in illustrating it. A paper by Mr. Aaron Penley "On Sketching from Nature," with illustrations, is itself worth the cost of the number. The venture promises very well.——"A Manual of Weathercasts and Storm Prognostics on Land and Sea." Compiled by Andrew Steinmetz. London: Routledge. This little volume contains both folk lore and scientific lore on the always interesting subject of the weather, with an explanation of the method in use at the Meteorological Office, and is said to be adapted for all countries, as well as for sea and land. The valuable contributions of Admiral Fitzroy, and other men of note, to the science of meteorology, are made use of by the compiler, who has produced a readable and interesting volume for all classes on the subject of weather-wisdom, well adapted to infuse a little sense and meaning into our every-day salutations and weather discussions.——"The Royal Guide to the London Charities, for 1866-7." Edited by Herbert Fry. Hardwicke, Piccadilly. This is the fourth annual edition of a useful alphabetical list of the vast number of charities with which London, above all other cities in the world, is richly endowed. The Guide is now under Royal patronage. It shows, in alphabetical order, the name of the charity, with its date of foundation, address, objects, income, chief officials, and so on.

Miscellanea.

IMPROVEMENTS IN ROTHBURY.—Modern improvements are being rapidly adopted in this quiet village. Water has recently been introduced by a private company; the seventh and eighth sections of the Northumberland Central Railway are progressing; the erection of Cragside House, the intended residence of Sir W. G. Armstrong, C.B., is being proceeded with; the Rev. C. G. V. Harcourt, rector, has caused another wing to be built on the old school endowed by the late Mr. Tomkinson, for those who attain to the higher branches of education; and the west end of the village is about to be provided with a new school, which is shortly to be built at Thropton, the old school at that place having fallen into a state of dilapidation. The building is likely to cost from 600*l.* to 700*l.* A new bank, the want of which has been long felt, is in course of erection.

HULME.—Three sites are under consideration for the Hulme and Chorlton Public Park. The Hulme Free Library has been opened. The building, which has been designed by Mr. Lynde, the Manchester city surveyor, is in consonance with the town-hall, of which it forms a part, and is in the Italian style. It forms the right wing of the building, the left wing constituting the vestry-hall and overseer's offices. The main entrance is in Stretford-road, and there is a side entrance in Clopton-street. The library is 42 ft. 9 in. by 29 ft. 6 in. It is of one story, and is lighted partly from the roof. The reading-room, which is also one story, is 47 ft. 6 in. by 42 ft. 9 in., and 29 ft. high. It is lighted by ten large windows. There are upper rooms for the committee and for storage; and there are extensive cellars, which it is intended to let off. The heating and ventilating apparatus is by Messrs. Haden, of Trowbridge. The clerk of the works was Mr. Samuel Taylor.

GIGANTIC VEHICLES.—Omnibuses on a new model have, it is said, been constructed in Paris, specially for horse-races and other out-door sights. They are so contrived that upwards of fifty persons can be seated on the roof, and each forms a kind of travelling grand stand.

INDEX TO CONTENTS OF FOREIGN PERIODICALS IN PATENT LIBRARY.—An "Index to the Foreign Scientific Periodicals contained in the Free Public Library of the Patent Office" is being printed by authority. The idea is a good one. The *Index* will be published on each alternate Friday, and the price will be 2d., or by post 3d.: annual subscription by post, 6s. 6d. It appears to be in very good hands.

RAILWAY COMPENSATION.—The owner of property required by a railway does not lose his right to have the value assessed by a jury, under section 23 of the Lands Clauses Act, because he has made no claim, and because the company have proceeded under section 85. They must have actually paid or tendered the money, or the owner may claim to go in under section 23 or 68. The Court of Queen's Bench thus decided in the case of *The Queen* v. *The Metropolitan Railway Company*.

MANCHESTER SOCIETY OF ARCHITECTS.—The annual general meeting of this society was held at the Royal Institution, on Monday, the 11th instant, when the president (Mr. Isaac Holden) read the report of the retiring council on the business that had engaged their attention during the past year, and which was ordered to be printed for the use of the members, &c. The following gentlemen were then elected to form the council for the ensuing year: Isaac Holden (president), J. Charlesworth (vice-president), W. H. Breakspear, W. R. Corson, P. Nunn, E. Salomons, I. Stevens, and J. Murgatroyd (honorary secretary).

A ROMAN GRIDIRON.—One of the most curious objects recently discovered in the excavations in France, says the *Intellectual Observer*, is what we may venture to call a Roman gridiron. It is engraved and described in a recent work by M. Maximilien de Ring, who has made extensive researches in the early cemeteries and burial-places in Alsace. This implement is extremely well made of iron coated with bronze, with a raised open guard on one side for the meat, and a groove to catch the melted fat. Along with this implement, in the same grave, were found a long iron knife and a bronze spoon or ladle with a long iron handle.

DUBLIN.—Tenders have been invited for a county hall, to be erected at Carrick-on-Suir, in the county Tipperary, Mr. J. Stirling Butler, architect. A new drapery mart is about to be commenced in the city of Dublin, from the designs of Mr. William Fogerty, to cover a plot of ground 160 ft. by 56 ft., at the corner of Henry-street and Denmark-street. The approved north light system of lighting is adopted. The style of the building is Astylar Italian; the facing generally of Belfont red bricks, dressings of granite and Portland cement. Mr. John Nolon is the contractor at 4,600*l.*, exclusive of fittings: inclusive of same the cost will probably amount to 6,000*l.*

THE SANITARY STATE OF ST. MARYLEBONE.—The monthly report for May, by the medical officer of health for the parish, has been issued. The death-rate is gradually declining with the advancing season. In April 352 deaths were registered, and in May 333. There is, however, a growing fatality amongst zymotic diseases, or those beyond all others preventible by sanitary means; and Dr. Whitmore urges the adoption of the proper measures to diminish this class of diseases, and to prepare against cholera should it attack us in the autumn. He states that the Thames companies' water supplied to the parish has showed, during the past month, an increasing improvement, and a greatly diminishing quantity of organic matter, whilst that obtained from the surface wells obviously becomes every month more impure and dangerous. "Owing to the bad and absolutely stinking condition of the water obtained from the pumps in New Cavendish-street and Upper Marylebone-street," he adds, "I have found it necessary to close both of them, in order that they may be properly examined, but I very much doubt if any amount of cleansing or repairing will render the water in either of them again fit for drinking purposes: the large quantity of ammonia in the water from the latter pump shows the infiltration of sewage."

ILKESTON.—Mr. Warner, of this town, builder, is the successful competitor for the building of the Ilkeston townhall. The work will be commenced immediately.

ALBERT GOLD MEDAL OF THE SOCIETY OF ARTS. The council of the Society of Arts have this year awarded this medal to Professor Faraday, "for his discoveries in electricity, magnetism, and chemistry, which in their application to the industries of the world have so largely promoted arts, manufactures, and commerce."

STAINING TILE PAVEMENTS. —In reply to an inquiry, manganese and cobalt are both used for staining tesselated pavement and tiles, artificial stone, and probably also brick. The black oxide of manganese can be had from manufacturing chemists, at 20s. per cwt., and black oxide of cobalt at 20s. per lb.

UNIVERSITY COLLEGE, LONDON.—Mr. Samuel Sharpe has presented to the college 1,000*l.* towards building a new wing, on condition that the donation be invested in Consols and allowed to increase at compound interest by investing the dividends in the same stock, until the council, after receiving other gifts for the same purpose, should think fit to make use of it for building.

VALUE OF LAND IN THE NEIGHBOURHOOD OF NEWPORT.—A sale by auction of copyhold property at Bassalleg, was held at the Westgate Hotel, Newport, June 14th, Mr. Augustus Stevens, of Bristol, being the auctioneer. The property realised the following sums:—Lot 1, cottage and market-garden, containing 2a. 2r. 14p., 405*l.*; lot 2, cottage and garden, containing 2a. 1r., 520*l.*; lot 3, two small cottages, 134*l.*; lot 4, five small cottages, 235*l.*

SELF-ACTING SIGNALS.—Sir Cusack P. Roney describes a new signal which he has seen in Paris. It is the invention of Signor Vincenzi, an Italian engineer, and works by electric agency. It is difficult to describe, but the mechanism comprises cast-iron cases placed along a railway, and containing electric apparatus, which causes the whistle of the locomotive to sound when the way is not clear, or when a train in advance has just passed. The communication between the apparatus and the engine is made by means of steel arms, which meet and act together. The inventor is said to be willing to test his apparatus at his own cost on an English railway.

DISCOVERY IN CARLISLE ABBEY.—While workmen were engaged in making excavations in the Abbey, on Monday, in order to level the ground at the east end of the Cathedral, about thirty stone shafts were laid bare. They are 4½ in. in diameter, average about 5 ft. in length, and, from the mortar adhering to them, it is evident that they have at some time been used in some part of the Cathedral buildings. The diameter of the shafts is the same as that of the shafts in the bays of the choir, aisles, &c., of the Cathedral, and it is conjectured that they have belonged to the orginal Early English clerestory of the edifice.

WAREHOUSEMEN AND CLERKS' SCHOOLS.—On Monday last his Royal Highness the Prince of Wales formally opened this large range of charitable schools, which have been erected in the neighbourhood of the Caterham Junction, near Croydon, and the first stone of which was laid by the Prince on July 11, 1863. The design of the institution is to clothe, maintain, and educate the children of warehousemen, clerks, and agents of every wholesale trade who have been engaged in warehouses or manufactories in any part of the United Kingdom, without distinction of sex or religion. Illustrations of the building will be found in a previous number of the *Builder*.

STATUE OF LORD MACAULAY.—In execution of a commission from the University of Cambridge, Mr. Woolner has completed in Carrara marble a full-length statue of Lord Macaulay. The hair, rough and abundant, is thrown back from the forehead in a mass, as was the custom to wear it. By placing the figure sitting in a chair, and enveloping it in the simple and graceful drapery of the gown of a master of arts, the want of height and elegance in the form has been artistically concealed. The right shoulder is drawn slightly in advance of the left. In the left hand is a book, between whose pages some of the fingers are inserted, as if to mark particular passages. It is intended that the statue shall be placed in the library of Trinity, the college which claims the distinction of numbering Lord Macaulay amongst its sons.

ARCHITECTURAL EXHIBITION SOCIETY. — On Tuesday evening, the 19th inst., Mr. T. Roger Smith delivered a lecture on "The Influence of Site in the Design of some celebrated Buildings," the last lecture of the session. The exhibition closes on the 30th inst.

ROYAL ACADEMICIANS.—On Monday evening the members of the Academy assembled at their rooms, in Trafalgar-square, to elect two artists to the full honours of the academy, when the choice fell upon Mr. George Richmond and the Baron Marochetti. At the same time Mr. S. F. Lynne was appointed travelling student in sculpture.

THE MEMORIAL FOUNTAIN, WESTMINSTER.—Owing to a misunderstanding with the contractor, the large fountain in Great George-street, of which we gave an engraving in our number for January 27th, is at present at a stand-still. We have been requested to state, that it is being carried out by the architect whose name was given, from a design by Mr. Charles Buxton, M.P. The details of the roof were designed by Messrs. Skidmore.

THE MIDLAND RAILWAY AND THE ST. PANCRAS BURIAL GROUND.—The offensive proceedings of the Midland railway people, already brought into public notice by the *Builder*, have led to an inquiry in the House of Commons as to whether these proceedings had come under the notice of the Government; to which Sir G. Grey replied, that they had, and that he had ordered an inspector under the Burials Act to investigate and report upon the circumstances of the case.

THE IRON TRADE.—*Ryland's Iron Trade Circular* states, that "the (quarterly) meeting at Birmingham may be said not to have been held," the stagnation of business was so great, and indeed the absence of the representatives of the trade so general. The circular quotes South Staffordshire bar-iron, at 7*l.* 7s. 6d. to 8*l.* 10s.; North Staffordshire, 7*l.* 15s. to 8*l.* 5s.; Northumberland, 7*l.* 10s. to 8*l.*; Welsh, 6*l.* 10s. to 6*l.* 15s. South Staffordshire pigs, 3*l.* to 4*l.* 12s. 6d.; North Staffordshire, 2*l.* 18s. to 3*l.* 5s.

THE ATLANTIC TELEGRAPH.—The cable has been completed, and the *Great Eastern* will sail from Sheerness on the 30th. Stopping for a time to coal at Beerhaven, she will reach Valentia about the second week of July, and the shore end of the cable having been connected with the main line, the operation of laying will be commenced. The big ship will first lay the new cable from the Irish coast to Trinity Bay, Newfoundland; and, assuming this to be successfully done, and telegraphic communication established, she will then steam back to the middle of the Atlantic, and attempt to pick up the cable lost overboard in July last.

WORKMEN'S TRAINS ON THE METROPOLITAN RAILWAY.—On the motion for the third reading of the Metropolitan Railway (Additional Powers) Bill, in the House of Lords, the Earl of Zetland moved the omission of Clause 42, which provided that the compensation for accidents occurring to workmen travelling by the "workmen's trains" on the Metropolitan Railway should be awarded by an arbitrator appointed by the Board of Trade. His lordship said he did not consider that the additional public advantages which might arise from the Bill would compensate for the abandonment of the constitutional principle of trial by jury. After some discussion, however, the motive was negatived without a division, and the Bill was then read a third time and passed.

THE PROPOSED GIGANTIC GAS WORKS NEAR VICTORIA PARK.—In a letter, dated 13th inst., to the *Star*, Mr. John Plummer, to whom the public in the east of London is indebted for pointing attention to the attempt to smuggle the gas building Bills through Parliament, says:—"The gas companies have gained a triumph. Thanks to the facilities afforded by the private bill system, they have been enabled to obtain a majority of 31 in a House of 307 in favour of the report of the Commons' committee; and, unless that decision be reversed at the third reading, which is expected to take place next week, the beauty and salubrity of Victoria Park, as a recreation-ground for the people of the east-end of London, will be seriously lessened, if not completely destroyed. . . If the gas companies succeed in carrying their measure in the Commons, we must throw ourselves upon the mercy of the House of Lords, for we shall not give up the People's Park without a struggle, even though we have to implore the assistance of the Crown."

TENDERS

For a detached house at North Grove, Highgate. Messrs. Reeves & Butcher, architects. Quantities supplied by Mr. J. Scott:—

Patman & Fotheringham	£3,722	0	0
Robinson	3,588	0	0
Macey	3,433	0	0
Higgs	3,333	0	0
Wheeler (accepted)	3,140	0	0

For building new aisle and restoring Titchfield Church, Hants. Quantities supplied by Rake & Ranwell:—

Nutt & Co.	£3,250	0	0
Dallimore	3,015	0	0
Selby & Collins	2,446	0	0
Rapley & Son	2,124	10	6
Till	1,895	0	0

For a shop and house in Godstone-road, Caterham, Surrey, for the Catheram Park Estate. Mr. G. Robson, architect:—

	House.			Shop.		
Hearle	£697	0	0	£582	0	0
Dawson	703	0	0	549	0	0
Diblin	640	0	0	525	0	0
Wood (accepted)	531	0	0	432	0	0

TO CORRESPONDENTS.

Steam Cooking for Hounds (F. S. says:—"Has steam ever been applied to the cooking of hounds' victuals, and how has it answered? am constructing stables and kennels for foxhounds, and would be obliged by information in construction and cost of an apparatus supplying steam to the oatmeal and flesh in the coppers, and hot water to the stables adjoining." We believe it answers perfectly well. Information as to special apparatus must be obtained from the manufacturers).—Semi-Villa (employ an architect).—Correspondent (locomotives ought to consume their own smoke, but very often do not. They are not constructed to burn *coal* smokelessly).—Dr. G. (next week).—C. F.—H. D.—R.—H. & M.—P.—C. L.—J. G.—R. & W.—J. R.—H. M. B.—P. B. L.—F. H. G.—J. W.—C. B.—T. C.—Mr. K.—*Semilis.*—A. O'N. H.—J. R. M.—R. L.—L. A. C. (we are forced to decline advising in private disputes on *ex parte* evidence).—C. E. R. (ditto).—B. (ditto).—R. P. L. J. (see under "Miscellanea").—Honorary Secretary, Architectural Exhibition (no card of admission to the lectures was received).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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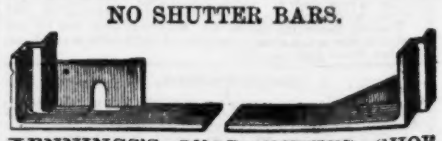

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